The Forest Management and Deer Habitat Integration Workshop

Algonquin Region

October 1-2, 1985

FOREWORD

Workshop Goal and Objectives

Goal:

To Encourage Forestry and Wildlife (deer) resource managers within Algonquin Region to become aware of the opportunities and advantages of forest-deer Integrated Resource Management (I.R.M.) and to become committed to this resource management philosophy within their respective Districts.

Objectives:

1) To provide an overview of the present deer and forestry management occurring within Algonquin Region;

2) To present in detail the biological/silvicultural background information essential for sound management of forest products and deer within the Algonquin Region; and

3) To provide an opportunity for open discussion on the following:

   a) how I.R.M. can/has been applied to forest/deer management within the Algonquin Region:

   b) where there is room to expand forestry/deer I.R.M.; and

   c) problem areas in which I.R.M. between forestry and deer management can not/have not occurred.

Setting and Format

The workshop was held on October 1st and 2nd at Lumina Lodge on Lake-of-Bays near Dwight. A total of 61 staff attended the workshop. An equal representation of Forestry and Wildlife staff attended from each District, the Leslie M. Frost Natural Resources Centre and the Regional Office from the Algonquin Region. The Algonquin Forestry Authority and Gravenhurst Technology and Development Centre were also represented at the workshop. The intent was to maintain an "In House" workshop to encourage vigorous and frank discussion among field and Regional staff.

Four guest speakers presented detailed forestry and deer management background information to the participants. This was followed by an evening panel discussion and three forestry/deer I.R.M. case studies from across the Region the next day.

Foreword

All major presentations and discussions have been recorded on VHS video and are available from the Algonquin Regional Office.

Enclosed are the proceedings of this workshop including, abstracts, papers, case studies and panel discussion summary. For further detail on the contents please contact the speakers directly or the co-chairmen.

Closing Comments

We would like to take this opportunity to thank all those people who made this workshop possible.

It is the belief of the co-chairmen that the goal and objectives of the workshop were met.

We hope that those Districts that have demonstrated at this workshop the successful integration of forest and deer management will continue to provide an example of encouragement to those Districts which have not yet successfully implemented an integrated forest and deer management program.

The true test of the philosophy of Integrated Resource Management is the establishment of a comprehensive forest and deer integrated management program across the Region and Province.

Co-chairman
Debbie Pella keen
Forester-in-Training
Bracebridge District

Co-chairman
Wayne Wilson
District Biologist
Minden District

TABLE OF CONTENTS

	PAGE
Foreword to the Workshop: Debbie Pella Keen & Wayne Wilson, Co-Chairmen	A
Opening Remarks: Ron Christie, Regional Director	1
An Introduction to the Forest Management Programme for Wildlife Managers: Paul Berges, Regional Forestry Specialist, Huntsville	2
An Introduction to the Deer Management Programme for Forest Managers: Howard Smith, Provincial Deer/Bear Co-ordinator, Head Office (Presented by Dave Euler)	11
Factors Affecting White-tailed Deer Populations in Ontario: Dave Euler, Fish and Wildlife Supervisor, Niagra District	20
Specific Habitat Needs for Deer in the Algonquin Region: Mike Wilton, Regional Wildlife Biologist, Huntsville	27
Forest Stand Dynamics of the Algonquin Region: Dave Wray, Regional Forestry Specialist, Huntsville	36
Frost Centre Forest Management/Deer Brief and Opening questions to panel: Mike Buss, Fish & Wildlife Specialist, Al Corlett, Forestry Specialist, L.M.F.N.R.C.	37
Panel and Open Discussion: The Forest Management/Deer Habitat Interface. Moderator: Larry Powell, Outdoor Recreation Supervisor, Algonquin Park District	42
Case Study No. 1: The Bonnecherre Deer Yard. Roy Gilbert, Forest Management Supervisor and John Johnson, Wildlife Management Officer and Enforcement Coordinator, Pembroke District	45
Case Study No. 2: The Hindon Deer Yard. Peter Hynard, Unit Forester and Dave Atkinson, Fish and Wildlife Supervisor, Minden District	54
Case Study No. 3: A Mosaic of Mini-Yards. Dave Deugo, Unit Forester and Doug Hyde, Conservation Officer Co-ordinator, Wildlife Management Officer, Bracebridge District	71
Closing Remarks: Where Do We Go From Here? Phil Smith, Regional Biologist and Terry Dodds, Regional Forester	82

INTRODUCTION

by Ron Christie, Regional Director, Algonquin Region

Good afternoon and welcome to this Forest Management/Deer Habitat Workshop. The need for this type of workshop has been evident for some time and the Unit Foresters, along with Terry Dodds, are to be commended for their initiative in getting this workshop going. In addition, I would like to say, "thank you" to Debbie and Wayne for the opportunity to say a few words to you today, and for their efforts in putting together what promises to be a good programme and for doing all of the things that are necessary to organize a workshop like this one.

I would also like to thank the people who have volunteered to present papers, take part in the panel discussions and to present case studies.

One of the "buzz-word" phrases that we are using these days is integrated resource management. Neither the concept nor the phrase itself are new. We have been doing I.R.M. for a long time to a greater or lesser extent in M.N.R. However, the I.R.M. process is being formalized. This formalization is necessary because it really forces us to try to decide what I.R.M. really means, after we discover what I.R.M. is. Then we can put the concept into effect.

To me, I.R.M. is a philosophy that, if we accept it, and we implement it, we will in fact become resource managers as opposed to forest managers, wildlife managers and so on. The philosophy that we must learn to accept is the philosophy of ecosystem management. We must try to get our minds around the concept of managing a forest in such a way that all of the benefits from that forest, including the trees and the animals, can be optimized. After we begin to see the forest as a system, then we can begin to develop and implement plans that will optimize the benefits.

In order to carry out the planning and the implementation of plans, Foresters, Biologists and others must work closely together and exchange information and ideas. This approach makes sense, not only from the point of view of good resource management, but is necessary because of staff and budget constraints that we are facing these days.

This workshop is designed to provide an open forum for you to discuss the forest/deer interface. Information will be presented on both forest and deer management programs, and the case studies will provide examples of the forest/deer interface in this region and, perhaps, an indication of how well or otherwise we have been able to embrace the I.R.M. philosophy. I urge each of you to take part in this workshop in a positive way. I would also urge you to think seriously about the I.R.M. philosophy with a view to doing our jobs better.

AN INTRODUCTION TO THE FOREST MANAGEMENT PROGRAM FOR WILDLIFE MANAGERS

by Paul Berges, Algonquin Regional Forestry Specialist

ABSTRACT

With Algonquin Region's diversity of forest stands and associations, recreational activities, fish and wildlife concerns, industry demands, people pressures, access issues, it has necessitated a coordinated forest management planning and implementation program need. A brief overview of the forest management planning aspects and operational components in the region are identified.

"AN INTRODUCTION TO THE FOREST MANAGEMENT PROGRAM FOR WILDLIFE MANAGERS"

By Paul Berges

ABSTRACT

With Algonquin Region's diversity of forest stands and associations, recreational activities, fish and wildlife concerns, industry demands, people pressures, access issues, it has necessitated a coordinated timber management planning and implementation program need. A brief overview of the timber management planning aspects and operational components in the region are identified.

In order to capsulize, the forest management program and how other uses (i.e. wildlife managers) can inter-face in it, a brief overview of the planning process with pertinent areas are highlighted.

Timber Management Plans are prepared for twenty year periods and must set out the objectives and strategies for management to provide a sustained flow of forest products while accommodating the requirements of other forest users. At the same time, the Timber Management Plan identifies, for the first five years, where forest operations will be carried out and how they will be conducted.

Every five years a new Timber Management Plan is produced which outlines the objectives and strategies for a twenty year period and provides operational detail for the first five years. In this manner, long term direction combined with shorter term detail is always available for forest management operations while the flexibility to adapt to changing conditions and needs is provided.

The plan production process which leads to an approved Timber Management Plan involves a number of key steps which are:

- Pre Planning
- Objective and Strategy Establishment and Development
- Determination of Management Alternatives
- Alternative Selection
- Plan Production and Submission
- Plan Review

There will be constant feedback during the planning which may require the re-evaluation of earlier decisions so that the process is seldom a regular progression through the steps.

The first three steps form the principle means in which users such as wildlife managers introduce their management concerns in this planning system. General discussion in this paper will focus on these areas.

1. PREPLANNING

Preplanning is the preparatory stage in the production of a timber management plan. It is initiated by the professional forester responsible for the plan production.

The forester gives notice to all other MNR resource management sectors, which may be expected to provide input, that the planning process is being initiated.

The District Manager, in consultation with the forester responsible for the plan, appoints a planning team to aid in plan production by providing direct input regarding other forest uses. It is the responsibility of the District Manager to ensure that all programs are represented and that the concerns of all programs are adequately addressed during the planning process. To this end, the District Manager may assign specific responsibilities or areas of concern to certain members of the planning team. This may include the mandate of "speaking for" concerns raised by outside sources during the planning exercise.

The planning team first collects and reviews the available background information and when necessary, arranges for the collection of further information. This familiarizes the team with the forest or management unit and with all the various factors which must be addressed in the plan. Once the planning team is familiar with the unit and has a comprehension of the task at hand, a planning schedule must be determined.

This preplanning phase must be instituted well in advance in order that sound decisions on aspects of resource management can be determined.

2. OBJECTIVE ESTABLISHMENT AND STRATEGY DEVELOPMENT

The District Land Use Guidelines have taken policy and applied it to the existing land and water resource base. The broad program objectives of MNR have been apportioned to each MNR Region and District in the form of targets which represent the region's and district's contribution to the achievement of the objectives. The Land Use Guidelines outline the districts' strategies for each program and the basis upon which they were developed. In addition, the guidelines identify, in general terms, the activities necessary to meet program targets; to minimize on other uses; and to assist in implementation of other programs.

Strategies must be developed to identify the activities necessary to meet the forest management targets and objectives, to consider other forest use requirements and to minimize adverse environmental impact. The strategies developed here help define feasible limits for the management alternatives.

Examples of the hierarchy of forest planning objectives are illustrated in Table 1.

TABLE 1

SAMPLE PLANNING OBJECTIVE FLOWCHART

PROVINCIAL FOREST OBJECTIVE

- To provide for an optimum contribution to the economy by forest-based industries consistent with sound environmental practices and to provide for other uses of the forest.

REGIONAL FOREST OBJECTIVES

- To provide the maximum continuous supply of timber for the local forest industry and to manage the forest in a manner that upgrades the quality of the forest products, therefrom.

- To maintain a forest which satisfies the requirements of timber production, aesthetics, recreational values, fish and wildlife habitat, soil and water resources.

- To maintain or improve the forest genetic base through appropriate silvicultural practices.

- To encourage the use of the full range of timber products that the forest yields.

DISTRICT AND/OR MANAGEMENT UNIT OBJECTIVES

- To give management priority to sites having the highest productive capacity and to established forest stands with the best quality growing stock.

- To manage forest stands, which are identified as deer winter yarding areas, to maintain and improve the existing wildlife habitat quality as well as for the production of forest products.

3. DETERMINATION OF MANAGEMENT ALTERNATIVES

Timber management planning requires the consideration of, and ultimate selection from among, a number of alternate methods for the provision of access, the harvest of the forest resource, and its subsequent renewal and maintenance. The alternative methods which may be used to attain the objectives and follow the strategies determined for the planning area must now be established.

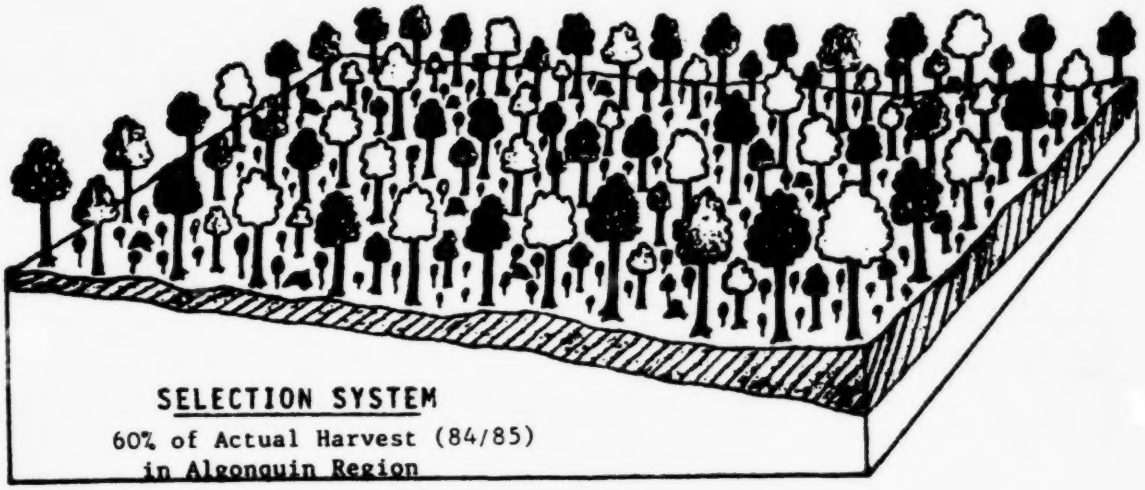
Determining management alternatives is a complex and lengthy process. Major areas of examination are:

(a) Identification of Constraints on Forest Operations
- (i) Biological Factors
- (ii) Physical Factors
- (iii) Economic Factors
- (iv) Environmental Factors
- (v) Social Considerations

(b) Determination of Silvicultural System Alternatives

(i) Selection System

Removing trees either as scattered individuals or in small groups. Trees which are mature or overmature, defective, high risk, undesirable species and/or competing with trees of higher potential may be removed from all size classes.



SELECTION SYSTEM

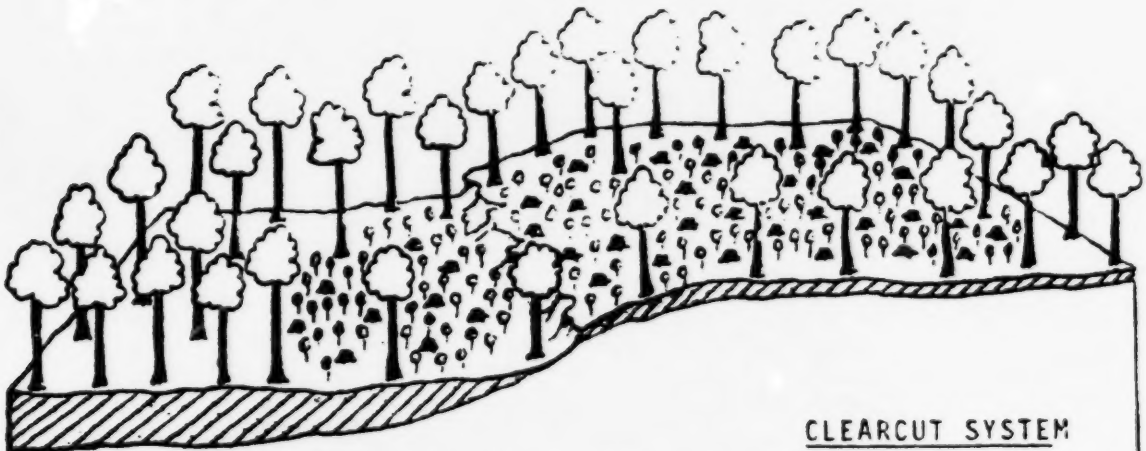
60% of Actual Harvest (84/85) in Algonquin Region

(ii) Shelterwood System
Any regeneration cutting in a more or less regular and mature stand, designed to establish a new crop under the protection overhead or side of the old.

SHELTERWOOD SYSTEM

30% of Actual Harvest (84/85) in Algonquin Region

(iii) Clear-Cut System
The removal of the entire standing crop.



CLEARCUT SYSTEM

10% of Actual Harvest (84/85) in Algonquin Region

(c) **Determination of Rotation or Cutting Cycle**
(d) **Calculation of Maximum Allowable Depletion**
(e) **Determination of Depletion and Surplus**
(f) **Determination of Renewal and Maintenance Alternatives**
(g) **Determination of Allocation Alternatives**
(h) **Determination of Allocation Criteria**

Areas are allocated for depletion, renewal, maintenance or other forest operations. Allocation for depletion is based mainly on maturity, with consideration for quality, proximity to access, the need for salvage and other reasons. Allocation for renewal is based on management strategies, renewal alternatives, the possibility of natural regeneration, site protection needs, etc. Allocation for maintenance is based on the maintenance alternatives, values to be protected, the expected return on investment, etc. Allocation for other forest operations such as the creation or enhancement of wildlife habitat or recreational opportunities is based on a variety of social and economic considerations.

Table 2 illustrates the typical management units summation of generalized forestry activities for the planning purposes of two major working groups in the Algonquin Region for the 20 year time frame.

TABLE 2

GENERALIZED SILVICULTURAL GUIDELINES

SAMPLE MANAGEMENT UNIT

*Stocking standards as per provincial guidelines

WORKING GROUP	SITE CLASS	PROPOSED WORKING GROUP	AREA (HA)	HARVEST	SITE PREPARATION	REGENERATION *	TENDING	ROTATION AGE
White Pine	All	Pw	49,000	Uniform Shelterwood (61-80 yrs.Prep.Cut; (81-100 yrs. Seed Cut (101-120 yrs. Removal Cut (121-140 yrs. Final Cut.	Prescribed burn mechanical and/or chemical	Natural or direct seeding supplemented by planting if stocking not obtained or expected in five years.	Thinning at app. 10 year intervals from age 30-60. Cleaning as required prior to age 30. Brush control and thinning to discriminate against hardwoods.	140 years
Hard Maple Uneven-aged (Selection)	All	Tolerant Hardwoods	58,035 (23,487) 23,500	Selection - Ideally the residual density not less than 80 sq. feet of b.a. of which not less than 40 sq. feet of b.a. is "crop" quality. Residual stocking below ideal may be considered depending on site and stand quality but must have 40 sq. feet of b.a. in "crop" quality trees.	None	Natural	N/A	20 year cutting cycle
Even-age (Uniform Shelterwood and Clear-Cutting)	All	Tolerant Hardwoods	8,200	2 Cut Uniform Shelterwood - (10 yr. interval between cuts) - residual not less than 50 sq. feet of b.a. and retain as much as possible in "crop" quality trees.	None	Natural	Thinning as required to cycle density between 110 sq. feet of b.a. and 80 sq. feet of b.a.	140 years
			4,550	Clear-cut residual not as above--present and future Potential of stand is limited--regeneration already present.	None	Natural	Tending as above and to discriminate against unwanted species.	140 years

From the areas which meet the criteria for allocation, specific areas must be selected on which operations will take place during the five year term of the plan. The total area to be allocated must be consistent with the alternatives for depletion, renewal and maintenance.

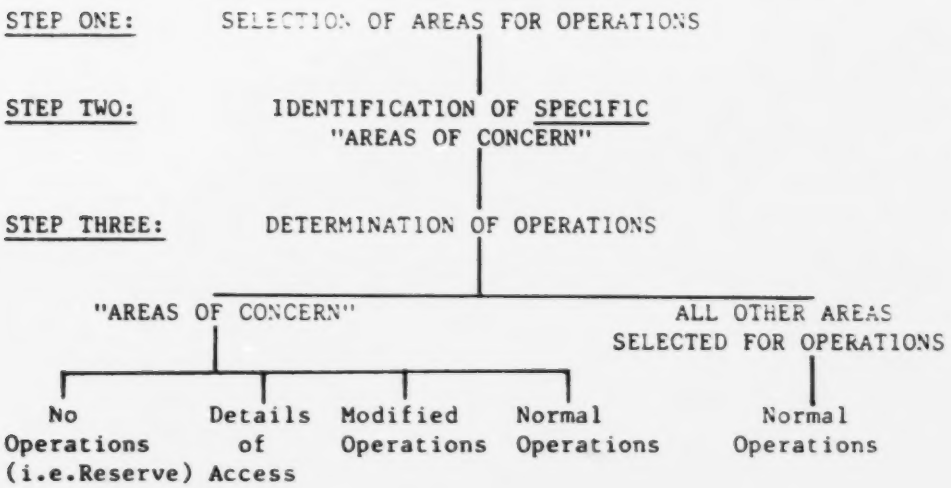
Within areas which are selected for allocation, specific areas of concern must be identified. This phase is a key role of the planning team. These specific areas of concern must be examined to determine if any special considerations are required in order to integrate management to minimize the impact of forestry operations on other values.

Figure 1 presents an illustration of the key planning process for the integration of other resource values in timber management for five year operating period.

FIGURE 1

THE PLANNING PROCESS FOR THE INTEGRATION OF OTHER RESOURCE VALUES IN TIMBER MANAGEMENT

FIVE YEAR OPERATING PLAN



"Areas of Concern" are defined as geographically defined areas of value to other users/uses which could be affected by timber managment operations including roads and which may require modifications to those operations.

Within the selected "areas of operations", specific "areas of concern" are identified, primarily by other MNR program groups (planning team) through refinement and expansion of the preliminary identification of "areas of concern" of the 20 year term of the plan using existing MNR resource data as the principal data source.

In addition, opportunities for the identification of specific "areas of concern" are provided for other government ministries, tourism, interest groups and the general public through the formal public consultation provisions of the planning process.

For the "areas of operations" outside of specific "areas of concerns", normal timber management operations will be carried out. In the preparation of the five year operating plan, specific prescriptions for those areas will not be determined; rather, general operational prescriptions will be described. These general prescriptions will provide flexibility for the determination of specific operational prescriptions at the level of the Annual Work Schedule.

Within specific "areas of concern" protection of other resource values will be ensured through comprehensive planning of timber management operations. The process involves consideration and analysis of options for access requirements, harvest, renewal and maintenance operations.

For individual "areas of concern", the product of the comprehensive planning process will not normally be a decision on only one of the four basic operational options (i.e. no operations, details of access, modified operations or normal operations). Rather, the application of the planning process will commonly involve consideration and analysis of various combinations of those options, with ultimate decisions on:

(1) an acceptable combination of options.

(2) a specific road location and associated use management strategy for each required primary and secondary road, and conditions on tertiary roads.

(3) a suitable modified management prescription for those portions of the "area of concern" in which modified operations are required.

In closing, remember that the District planning team involved in the production of a Timber Management Plan should always

PLAN THEIR WORK - WORK THEIR PLAN

AN INTRODUCTION TO THE DEER MANAGEMENT PROGRAM FOR FOREST MANAGERS

by Howard Smith, Provincial Deer/Bear Program Co-ordinator

ABSTRACT

PART I: LIFE HISTROY OF WHITE-TAILED DEER IN ONTARIO

The white-tailed deer is one of the most adaptable animals in the world. Its range extends from areas having subartic to tropical conditions. White-tails are an important part of Ontario's wildlife heritage and have a significant recreational and economic impact on Ontario. An appreciation of the life history and basic requirements of deer better enables managers to integrate various wildlife-forestry operations. The yearly life cycle of white-tailed deer is discussed to reflect their behaviour and seasonal needs.

PART II: ONTARIO'S DEER MANAGEMENT PROGRAM

White-tailed deer were numerous in Ontario during the 1920's and 1930's, although certain herds did not peak until the 1950's. From the mid 1950's to the late 1970's, the number of deer had decreased by nearly 70 per cent. In 1975, the Ministry began to study the reasons for the decline and to suggest solutions to the problems. Climate, hunting, poaching, predation and habitat loss were all involved in causing the decline of our deer herds. Components of the current deer program reflect program changes to increase deer populations. These components are the selective harvest system (antlerless tags), improved enforcement, selective predator control, habitat management and date collection and analysis.

LIFE HISTORY OF WHITE-TAILED DEER

by Howard Smith

White-tailed deer are one of the most adaptable animals in the world. Their range extends from near sub-arctic to tropical and desert conditions. They are found in all of the Canadian provinces except Newfoundland and the territories, forty five states, Mexico, Central America and northern South America. The range extension of deer has been primarily due to forestry and agricultural practices which have disturbed the mature forests to create good deer habitat.

White-tails are also very adaptable with respect to human activity. They can be found living quite well in heavily built-up areas within cities. The extent of adaptability of white-tails is reflected in that they have existed for over 18 million years. Looking at the behaviour and life history of deer gives a good insight into how they adapt to such a wide variety of conditions. White-tails are basically shy and secretive in their behaviour. Their early ancestors originated in open grassland country where running to escape predators was necessary. As a result, deer are specialized for running, having long limbs, flexible spine and special leg muscles which allow them to leap quickly.

Deer in Ontario tend to be larger than deer in the southern United States. This is an adaptive feature for winter survival in that the larger the animal the smaller the surface area to volume of the deer. This conserves needed energy. The type and function of other adaptions can be seen as we look at the yearly life cycle of white-tailed deer.

With the advent of fall, deer change both physically and behaviourally. The most obvious change is the coat colour which becomes brownish-grey from the summer reddish-brown. Also the type and depth of hair alters from a thin summer hair which allows easy release of body heat to a deeper thick winter coat which traps body heat - a definite asset for winter!

In bucks, antlers cease growing and the velvet covering dries up and is sloughed or rubbed off on small trees or branches. Antler size is dependent on nutrition, age and social status. The number of points cannot be used to tell the age. In preparation for the breeding season or rut which in the Algonquin Region occurs in early November, the

neck begins to swell. Like the shedding of velvet, neck swelling results as blood levels of the male hormone testosterone increase.

As the rut approaches, bucks become more restless and aggressive towards other bucks. Summer buck groups break-up and a larger amount of time and energy is spent establishing and maintaining social rank in competition for courting females. During the rut bucks eat very little and move about looking for females in heat. At this time they can lose considerable weight which puts them at a disadvantage entering winter. Bucks will follow a doe until she is serviced then lose interest and seek out another doe. A doe is in heat for 24 hours but if not bred will come into heat again in 28 days. Fetal development takes about 200 days, with most fawns born the end of May or early June. Some female fawns (16% in Algonquin Region) are bred, usually later in December or January. As a result, their fawns are singles and born later. The fall is a time for building fat reserves for winter. Well nourished does are nearly twice as productive as does on a restricted poor diet. Yearling does productivity can jump from 0 to 1.2 fawns/doe. The severity of the winter and the physical condition of pregnant does has considerable influence on fawn birth weights and survival.

As the breeding season ends and bucks shed their antlers, deer tend to reform family groups which join with other family groups. This generally occurs on their way to and in winter concentration areas or deer yards. In the Algonquin Region deer move to traditional winter yards where conifer cover exists. This movement depends on temperature and early snows. Some deer may not move into yards until late January. Deer yard in response to protection from severe weather. Food is of secondary importance. The primary force seems to be shelter more so than food supplies. Deer have evolved to adapt to winter conditions by gearing their body functions down so that demands on stored energy supplies and food are much reduced. Their daily movements are less and they stay bedded during adverse weather, feed during the warmest part of the day and voluntarily restrict their food intake. By midwinter in the Algonquin area, they could be considered in a state of "walking hibernation".

Assuming deer have entered the winter in good condition they can go for 30 days without food and survive. The crutical time for white-tails is late

winter when the days become longer and warmer and their metabolic rate increases. This means deer are more active and require more feed. If there are severe late winter storms and winter drags on into April, heavy mortality can occur. Death by malnutrition can occur when there is not sufficient quality and quantity of feed to sustain deer present in the yard.

The quality of food available to deer in winter generally does not provide much more than a maintenance diet. In late winter, pregnant does need a diet higher protein (12% +) and more trace minerals than is provided in browse. Providing browse to deer who may be in very poor shape anyway after late winter storms may not improve survival to the extent desired. Depending on the does condition, she may survive but her fetuses may not.

Recent and ongoing research is indicating that a feeding program should give a high quality and balanced ratio rather than providing low protein browse in late winter.

Deer mortality in the winter period does not generally occur until the winter-spring transition period. If important sources of high protein foods such as those found on exposed south slopes, herbacious openings and farm fields become available in March and April, deer survival is maximized. The normal order for winter mortality is fawns, bucks and adult does.

Deer still associate in groups through the winter and spring. Large groups can be seen in fields in early spring. Many yards throughout Algonquin Region have old farm fields near them which are extensively used. Indeed many yards may be where they are because of the farm fields for spring use.

As fawning season approached winter spring groups dispense and pregnant does reject their yearling just prior to fawning. Fawning sites are variable but grassy areas around beaver meadows are favourites.

Fawns do not move much during the first few days and the doe is not continuosly with the fawn. Fawns choose their own bedding sites, which disassociates the scent of the doe from the fawn. She periodically returns to nurse the fawn. The does home range is very restricted until the fawn can begin travel at 3-4 weeks of age. By this time fawns are

experimenting with food items such as grass and new browse. Fawns exhibit playfullness by play running around the doe after nursing. Play behaviour is less common by fall and ceases by winter. After fawns are 2 months old, their activity cycle corresponds closely to that of the doe.

By late summer-early fall, does with fawns will tolerate their yearly offspring again. Commonly female yearlings will rejoin the doe but not male yearlings.

Bucks associate in small groups throughout the summer and are joined by yearlings driven out of family groups. Buck groups are not permanent associations and membership is constantly shifting. This pattern continues until the beginning of the fall rut when the annual cycle repeats.

DEER MANAGEMENT IN ONTARIO

Introduction

White-tailed deer were more numerous in Ontario during the 1920's and 1930's, although populations in certain regions did not peak until the 1950's. From the mid-1950's to the late 1970's, the number of deer decreased by almost 70%. People did not see deer as often as they used to in Ontario. In addition, the number of hunters and their chances of success also declined during this period. In 1975, the Ministry of Natural Resources began an intensive study of the reasons for these declines. The following problems were identified as important causes of the herd decline: Climate, Hunting, Poaching, Predation and Habitat.

Problems

Climate

During the winter, when deer are confined to conifer shelter areas, long periods of low temperatures and deep snow make it difficult for them to survive. Long, harsh winters may also reduce the number of fawns born in the following spring. Pregnant females that are under-nourished cannot produce healthy, robust fawns.

During the 1950's, 60's and 70's winters were slightly colder, and the average snow depth had increased. Exceptionally severe groups of winters in the late 1950's and throughout much of the 1970's killed many deer.

Hunting

In a few areas, hunters took less than 10% of the deer population. However, in much of Ontario's traditional deer hunting range, 10 to 25% of the deer herd had been harvested annually. Harvest were as high as 40% of the herd in some areas such as Bracebridge.

Other state and provincial agencies have found that deer populations start to decline when more than 10 to 15% of the adult does are harvested. Attempts to reduce the harvest by shortening the season length were only partially successful. This method increases hunter density which often decreases the quality of the hunt. Furthermore, the total kill is often not significantly lower when seasons are shortened.

Hunter-landowner conflict has resulted in the loss of hunting opportunities in agricultural southern Ontario, even though deer were abundant.

Poaching

The number of deer taken by poachers is difficult to assess. Although in some areas it may have exceeded the legal kill, in most areas deer managers believed that it was less than the legal harvest. Deer taken by poachers are not available for legal harvest or viewing, and contributed to depressing the population.

Predation

Predation and harassment of deer by wolves and dogs can be a significant factor affecting deer populations. Wolf predation on white-tailed deer is a natural situation in much of Ontario. However, unusual winter conditions may arise which allow predators to travel on the snow but cause deer to flounder. Deer in wintering areas are particularly vulnerable to these snow conditions, and predation may take a larger than normal portion of the

herd. Wolf predation has been responsible for eliminating deer from some yards.

Dog harassment and predation can cause serious problems in southern agricultural areas. Dogs can kill or cause does to abort. This can have a major impact on herd productivity in these areas.

Habitat

Before European settlers arrived, white tails were found primarily along the shores of Lake Ontario and Lake Erie, and to a lesser extend in central Ontario. However, as land was cleared by the early settlers for agriculture, and the forest cut for lumber and fuelwood, better deer habitat was created. During this early period, numberous slash fires also stimulated plant grouwh in the forest floor. Adequate winter shelter was left because of the low demand for poorer quality conifers. The result was drastically increased deer populations. In the early part of the twentieth century deer were very abundant throughout central, southern and northwestern Ontario.

Since the 50's, the continued cutting of conifer shelter and the maturation of hardwood forests has resulted in deteriorating habitat quality. As a consequence, the habitat is not as good as it was earlier in this century.

In summary, the problems faced by Ontario's white tails were:
- o generally colder winters with slightly deeper snow;
- o overharvest by legal hunters, and no adequate system in place to reduce harvest;
- o losses due to poaching;
- o an important loss due to wolves and dogs at specific times and in certain areas;
- o and, deteriorating habitat conditions in certain traditional deer hunting areas.

Solutions to the Problems

The new deer management program which began in 1980 addressed six areas which would help turn around the Ontario deer herd's decline:
- o improved control of harvest;
- o more enforcement;
- o selective predator control;
- o enhanced habitat management;
- o improved data collection and analysis;
- o improved research.

Although climate cannot be controlled, its harmful effects may be lessened through proper habitat management including supplementary feeding.

Control of Harvest

Under existing habitat conditions, the range would support considerably more deer than were present. To allow the population to increase, hunter harvest had to be controlled.

The selective harvest system was the most appropriate option for improving harvest management in Ontario. It provides a season wherein all hunters can continue to hunt antlerled deer. At the same time, a limited number of hunters are allowed to hunt antlerless deer in order to regulate herd size. The number of tags available depends on the status of the herd within a

Wildlife Management Unit.

Legal deer harvests in agricultural southern Ontario were very low and achieved primarily through primitive weapons seasons. Successful development of gun hunts using a harvest system acceptable to landowners began in 1979 and now 10 Districts have such hunts. Principal elements include control of hunter numbers, restrictions on weapons and landowner preference.

Enforcement
Implementation of a selective harvest system, controlled hunts, and increased control of dogs required an additional enforcement effort.

Selective Predator Control
Selective predator control was needed in many parts of the Province. Control is most effective when designed to reduce specific predator populations either during, or somewhat before the winter deer yarding period. Such control may not reduce the year to year wolf population, but this is not necessary to effect a reduction in winter deer losses. Control of dog predation and harassment during winter and spring is essential to minimize deer losses. A program to provide information to the public was begun along with additional enforcement effort directed towards controlling dogs.

Habitat Management
The long-term future of deer herds in Ontario will be strongly influenced by changes in forest vegetation. In addition, modification of timber harvest practices can provide an effective method of producing good habitat for deer.

Habitat management practices include: winter range management, summer range management and winter emergency work.

Winter range management involves: cutting of trees and shrubs to promote future food production, and protection, improvement and creation of winter shelter.

Summer range management consists of: creation or maintenance of openings, prescribed burns and management of beaver-flooded areas.

Winter emergency work includes: cutting browse for immediate use, breaking trails and supplementary feeding.

Data Collection and Analysis
There is little use in making management changes changes unless we are able to measure the results. The analyses resulting from a coordinated data collection system will be used to modify the management program to meet the changing needs of the resource itself and the resource users.

Information on the animals, their habitat and the users is collected. Examples are as follows:
- o deer population estimates;
- o legal and illegal deer harvest information by age and sex;
- o non-hunting mortality statistics;
- o reproductive information;
- o effects of predation losses and assessment of predator control

programs;
- o deer condition data;
- o data on quality and quantity of habitat;
- o user surveys.

Such information cannot only tell us about the effectiveness of the management measures, but will also be useful in building predictive models which give a good indication of the future structure of the herd.

Research

Management-oriented research must be an integral part of a deer management program. Many biological and social conditions are specific to Ontario and, therefore, can best be addressed by research projects done in Ontario.

To support the deer management program, research should examine such things as deer productivity, harvest methods and their impact, habitat requirements including supplementary feeding, predation and poaching.

Summary

The solutions to deer management problems are complex and have caused some problems of adjustment for hunters.

The selective harvest system which allows everyone to continue hunting has resulted in herd increases. Habitat improvement, enforcement and selective predator control can enhance the deer management program to increase and maintain deer numbers.

FACTORS AFFECTING DEER POPULATIONS IN ONTARIO

by David Euler, Acting Fish and Wildlife Supervisor, Niagara District

ABSTRACT

Although white-tailed deer are sensitive to numerous factors in their environment, they also can rebound quickly following devastating losses. Harsh winter weather may kill many animals, predators often remove them from the population, and human hunters sometimes harvest large numbers. When favourable conditions return and mortality is reduced, these animals are very fecund and the populations grow quickly. Managers must keep a long-term perspective when working with deer populations. In Ontario, deer herds have increased dramatically in recent years following reductions in hunting pressure.

NO-FRILLS DEER MANAGEMENT, THE SAFE-FAIL APPROACH

David Euler, October 1985.

INTRODUCTION

The only fact that deer managers know without any doubt is that many of their decisions will be wrong. Population dynamics of these animals are not fully understood and the unknown still outnumber the known facts when population information is collected. This problem does not render the manager helpless, however, and in fact is quite the opposite. The challenge for managers is to see clearly through a murky glass. If everything was clear, much of the challenge and interest would be lost.

The most successful deer management programs provide a great deal of assurance that any mistakes in management will not have serious negative consequences to the population. Management failures, as they inevitably occur, will be safe ones. Fail-safe, the concept that with enough hard work and attention to detail, mistakes can be avoided is unrealistic. Safe failures, however are realistic and managers should strive to achieve them.

If every animal in a deer population was radio-collared and followed daily, it would be fairly easy to manage the population. The animals location would be known, their presence recorded and their daily habits studied. In the real world, by contrast, virtually every measurement of ungulate populations is an imprecise estimate of a parameter undergoing constant and unpredictable change. This occurs, not because deer managers are unskilled, but because the difficulties in measurement are significant and state-of-the-art scientific research has not overcome them.

PROBLEMS IN DEER MANAGEMENT

Population estimates for deer in Ontario are an excellent illustration of the problem. Effective management of any natural resource often begins with a basic inventory. Management decisions are based on the number of the resource needed and are compared to the number present. If there are too many animals perhaps a hunt is needed to thin them out. If there are too few, perhaps habitat management or a reduction in hunting pressure is indicated. In deer management, however, there is seldom a basic inventory available to the manager. Aerial surveys, even by helicopter, are difficult because in the mixed conifer-deciduous forest over much of the deer range, the animals are hidden and cannot be counted accurately. Pellet group surveys are often very imprecise and extremely expensive. Drive counts and sample-resample techniques are so expensive and difficult that only a few limited areas are suitable for their use. Thus that most basic parameter, a count of animals present, is unavailable to most managers.

Other problem areas include: understanding the impact of hunting on the herd, knowing when and how predators impact the population and monitoring the relationship between food resources and the animals. Even though white-tailed deer are the most studied wild animal in the entire world, many unanswered questions face those who must make decisions about their management.

DEER DECLINE IN ONTARIO

In Ontario, the practical and difficult management question which needed an answer in the decades following 1960 and 1970 was "Why have deer numbers declined?". Probably because we didn't know the basic information we needed to know, most of us gave an erronous answer to that question. The wisdom of 20/20 hindsight now suggests we were wrong. Most Ontario biologists believed that harsh winters and poor habitat were the progenators of the problem. More recent events and knowledge have led to the conclusion that these two, while not unimportant, were not the most important factors in causing herds to decline. A review of those events is still instructive from both a forest/wildlife management perspective as well as the over-all decision-making process in natural resource management.

Despite our inability to measure deer populations with accuracy and precision, there is absolutely no doubt that deer populations declined substantially during the 4 or 5 decades prior to 1960. How much they declined, why they declined and the proper management steps to halt the decline were the subject of extensive debate. MNR staff tried to measure the declines using pellet group surveys and various parameters from harvested animals. A reasonably complete account of this effort is given in "the Yellow Book" prepared by a deer technical committee and formally entitled "Ontario Deer Management: Problems and Solutions". Essentially the conclusion that herds were reduced came from people who had lived in the area for many years. They knew and everyone else knew, without the comfort of hard statistics, but with the surety of first hand knowledge that deer were less numerous than in the past, considerably less numerous than in the past! Our best estimates, using the best numbers available, suggested a 70 percent decline between 1950 and 1980.

In the crisis-like atmosphere that prevailed, the search was on for the culprit, that elusive "cause" for the decline that if reversed, would allow deer to rebound. Most people believed that habitat and harsh winters were the major problem. Most wild animals populations are intimately tied to their habitat and numbers rise and fall with the quality of that habitat. Further, the central deer range does not have the best available habitat. Compared to other areas, openings are lacking, there is not enough second growth forest and much of the best winter shelter has been lost to logging operations. Difficult winters, such as 1970-71 left many dead deer in their wake. The most logical and appropriate search for the problem identified the habit-winter weather twins. Many people blamed wolves, of course, and still do. However, once again the lack of evidence that they were depressing the population meant this view was not generally accepted.

If habitat was the major problem then, logically, habitat improvement should bring about an increase in deer. During the 1970's considerable effort was spent cutting browse to provide winter food, a hemlock cutting moritorium was applied throughout Algonquin Region and other efforts were expanded to improve habitat. Predator control was applied in many areas and wolf trapping was common. Despite a great deal of work, however, nothing much happened to the deer herd. By 1980 there was little apparent change, numbers were low and hunters continued to complain about the scarcity of animals. The best estimates suggest deer numbers were, on average, less that 1 per square mile.

CHANGES IN DEER MANAGEMENT

Two major changes in Ontario's deer management began in 1980. First the amount and number of winter feeding projects increased dramatically and a major change in the hunting system, the Selective Harvest System was introduced. Since those changes the deer herd has increased dramatically in those areas where it was formerly very low.

There are some interesting parallels to the herd decline several years earlier. First, how do we know deer numbers have increased so much? Once again the answer comes not from hard data, because inventory results are mostly nonexistant, but from pervasive knowledge that is almost universally accepted. Virtually everyone associated with the bush in any way from John Power, The Toronto Star columnist, to Ralph Bice, the backwoods trapper, agree that they see more deer and more deer sign. There is no doubt in anyone's mind that deer have increased, though concrete proof is difficult to achieve.

The "why" part of the question is also difficult. However, we are not without knowledge. First the basic change in the type of hunting has to be given major credit for the increase in deer. When Selective Harvest was first introduced, many managers reduced their antlerless permits to the very lowest level possible. Virtually all of the white-tailed deer literature would predict that this would stimulate an increase in the herd.* And in fact it did. The other factors in the equation i.e., winter, predation, habitat and winter feeding also need to be examined for their role in the increase.

There is little evidence that the severity of winter weather was a major factor in the increase. Winters have not been significantly different over the period following Selective Harvest than before. While the time since 1980 has been short there is little evidence to credit the major increase in deer to a major change in weather.

It is hard to show much difference in wolf populations before and after the change in the hunting system. To support the hypothesis that lack of wolves was responsible for the major increase in deer would require major shifts in wolf numbers.

---

*McCullough, D. R. 1979. The George Reserve Deer Herd: Population Ecology of a K-selected species. Univ. Mich. Press, Ann Arbor, MI. 271 pp.

That shift would not have gone unnoticed. If a change in predation rates was responsible for a major increase in the deer population, there would have had to be a relatively large change in the predators which prey on them. That change would probably have been so large and so prominent, most managers would have noticed it.

The basic habitat conditions over the major deer range have not changed in the short five years of the new deer program. Forest vegetation changes slowly and habitat changes cannot be held responsible for the massive increase in deer populations.

In addition to the change in harvest, winter feeding has taken on new emphasis in this era. More grain in more places have meant more deer have had access to a high quality food source than ever before. Unfortunately, as in other areas, proof of the value of this activity is lacking. Deer certainly have to eat and good food is better than poor food, thus, common sense would suggest that this food has had an impact. How important it is and if it serves to stimulate population increase are questions now under study, but at this time remain unanswered. We should not forget that this assumption may also be wrong.

FUTURE MANAGEMENT CHALLENGES

An overall summary of deer management in Ontario suggest a long period of declining numbers. Then changes in management strategy have coincided with major increases in the herd. The most probable cause of the increase has been the change in hunting system which has meant less mortality on the breeding segments of the herd and the increase in feeding programs through out the deer range.

The most important question facing both wildlife managers and forest managers next is; how many deer do we need and what are our requirements for wood fibre from the forest? We can manage for a variety of products, maximizing deer or fibre or trying to integrate both into our management schedule. Further it must be remembered that because of the nature of our work we can be certain that our decisions will often be wrong.

For example habitat conditions for deer were not as important in the decline of deer as we thought earlier. Nor have they been of over-riding importance in the herd increase. However that does not mean that habitat is unimportant.

Habitat conditions and our decisions with regard to managing habitat for deer are probably more important than ever. More deer are available and to keep them habitat has to be provided. The relative amounts of deer and timber we require must be decided and then plans laid to provide conditions for those animals. The proper mix of hunting pressure, habitat and external food supplies must be found to meet the needs expressed by the people of Ontario.

The challenge this imposes to deer and forest managers is a big one. The "people" of Ontario do not always make clear what they want from the forests. Different interest groups want different results. All natural resource decisions are risky because we often do not realize all the consequences of our actions. The possibility of error is high. Our winter-feeding programs, for example, may be creating deer that are dependent on this activity, and if we are forced to stop, a major die-off could occur.

In the face of this challenge then we must redouble efforts to determine what mix of wildlife and timber we want from the forest, how best to integrate forest and wildlife management activities and devise systems that are safe-failures. If we are wrong, as we know will often happen, let us make sure our failures are safe ones. This is the challenge of the 1980's for wildlife and forest managers: Management systems that work and that guard against having wrong decisions be detrimental to the resources we manage.

A specific example of a safe-failure technique is outlined in a paper Howard Smith and I*wrote concerning how to set antlerless quotas. In this example we distilled all the information known about harvest management into a simple ratio, the percent females in the hunter kill. As long as the manager keeps the ratio of females to males in the harvest below a set number, she can almost guarantee that hunting will not be responsible for a herd decline. If there is an error made in population inventory, habitat management quota setting or season setting they need not be devastating as long as this ratio is kept within bounds. This is an example of the kind of management guidelines we need in the future. Simple guidelines, effective and built in such a way that they provide safe failures are desperately needed. Once we have them in place we can move forward to meet the challenge of the 1980's in both timber, wildlife and integrated resource management.

Euler, D. L. and H. Smith 1984. Evaluating kill quotas for deer using minimal data. (Typescript available from the authors.)

SPECIFIC HABITAT NEEDS FOR DEER IN THE ALGONQUIN REGION, CONSIDERING POSSIBLE AREAS OF GREATER COOPERATION BETWEEN FORESTRY AND WILDLIFE MANAGEMENT -- AS SEEN THROUGH THE EYES OF A WILDLIFE MANAGER

M.L. Wilton, Regional Wildlife Biologist, Huntsville

Abstract: The main seasonal habitat requirements necessary to sustain white-tailed deer (Odocoileus virginianus) in the Algonquin Region are discussed. The two major stand associations (timber types) of importance to wintering deer in the Region are described as to location and species composition. Possible short term and long term management techniques and problems together with inherent areas of possible greater cooperation, as they apply to seasonal deer requirements and the two major stand associations, are examined.

Introduction

The "deer-year" may be divided into four main components; spring, summer, fall and winter. While spring, summer and fall are all important seasons for deer, their importance stems mainly from how well they enable deer to prepare for, or recover from, a severe winter. Therefore, I would say that winter is the most critical portion of the deer-year since that is the time when most habitat related mortality occurs. If winter is not severe and deer are not forced to yard tightly then mortality is generally light, regardless of the conditions encountered during the previous summer and fall or the ensuing spring.

If the winter is severe, however, then not only does the winter habitat become directly critical, but also the summer, fall and ensuing spring conditions take on added indirect importance. Plenty of high protein herbaceous material such as grasses and forbes (associated with permanent openings) through the summer period, plus a strong mast crop (acorns and beech nuts), can enable deer to withstand greater stress during the winter yarding period. In addition, early green-up in the spring, also associated with permanent openings, can supply lush herbaceous high protein growth, so necessary for the survival of does and fawns.

It is the winter, however, that can deliver the hammer blow to a deer population, in spite of the benefits derived from the other three seasons, if enough winter habitat of sufficiently high quality cannot be made available to ensure survival.

Winter for deer in the Algonquin Region can be extremely rigorous (Figure 1). Snow depths exceeding 90 cm (36 inches) and temperatures of -40 °C (-40° F) are not uncommon. During the 30 year period 1953-1983, 7 (23.3%) winters were classed as severe and 2 (6.7%) were classed as extreme (Verme, 1968). In other words 30% of winters during the period could be described as severe or worse. This appears to clearly imply that deer in the Algonquin Region are often faced with an unusually tough set of circumstances in which to survive and increase their numbers.

Seasonal Habitat Requirements

Spring

Early green-up can provide lush high protein vegetation which is especially important for does in the latter stages of pregnancy, as well as for the previous year's fawns (this year's yearlings) which, because of their smaller size, have

suffered most drastically from the rigours of winter. Permanent openings, particularly those with a south facing aspect, located close to deer yards and supporting rich growth of leguminous plants, offer earlier green-up than forested areas and are particularly valuable to deer moving from the winter yards toward their summer range.

Summer

Summer range may be likened to a target with the winter range (or deer yard) representing the bull's eye. Because deer are spread reasonably uniformly across the "target" area during the summer, it stands to reason that competition for sufficient feed will be greatly reduced. It should be remembered, however, that fawning generally takes place in early June (H. Smith pers. comm.) and milking fawns place additional stress on does. Bucks as well require higher nutritional levels during this period because of antler development. Moreover, it has recently been learned (Lintack pers. comm.) that contrary to what was previously believed, body fat levels which were depleted during the winter may remain low until well into August.

Therefore, while mortality losses due to insufficient feed are unlikely during the summer period, deer which have access to summer range consisting of a high proportion of permanent openings and cultivated fields will probably be in better nutritional condition by fall than deer which have summered in totally forested areas.

Fall

While deer summering in forested areas may not obtain the benefit of cultivated fields, they may be in closer proximity to hardwood ridges and thereby attain a higher nutritional plane in years of good beech nut and acorn production. Hardwood ridges containing beech (Fagus grandifolia) and oak (Quercus spp.) in close proximity to deer yards are particularly desirable, since deer may benefit from mast crops not only during the fall, but on into the winter (yarding) period, particularly in years of moderate snow depths, for deer will dig through as much as 30 cm (1 foot) of snow for acorns and beech nuts.

While it is of little significance from a silvicultural standpoint, wood fern (Dryopteris spinulosa) is a much sought-after food source for deer in the fall and early winter period. This species, which will frequently be dug for beneath the snow, often seems to occur in association with hardwoods and, therefore, is likely more plentiful in the western portion of the Algonquin Region.

Winter - The Bottleneck!

While spring, summer and fall range are all important to deer, it is winter range in the Algonquin Region which is most critical to survival and expansion of the herd. It just stands to reason that if mortality due to competition for available food is going to occur, it will happen when the deer are crowded into 5-10% of the available range (deer yards) rather than when they are spread uniformly across the entire available range (spring-summer-fall). Moreover it further stands to reason that if such mortality is going to occur, it will affect the fawns most adversely, owing primarily to their smaller stature.

In the winter, deer have two major habitat requirements - cover (or shelter) and food. A north-south height-of-land passing through central Algonquin Park divides the Region roughly into eastern and western halves. The predominant stand association occurring in the eastern half of the Region is pine/poplar, while the predominant stand association occurring in the western half of the Region is tolerant hardwood/hemlock. Generally, snow depths in the western half of the Region are greater than in the eastern half because of "lake effect" from Georgian Bay.

Deer need winter coniferous cover in order that snow depths may be minimized, to allow travel for food foraging and escape from predators. This cover is best provided in the eastern portion of the Region by white pine (Pinus strobus), cedar (Thuja occidentalis), red pine (Pinus resinosa), white spruce (Picea glauca) and balsam (Abies balsamea) in that approximate order, and in the western portion of the Region by hemlock (Tsuga canadensis), white pine, spruce, cedar and balsam in that approximate order.

Deer feed in the winter by browsing the buds and branch tips of such species as red maple (Acer rubrum), white birch (Betula papyrifera), poplar, (Populus spp.), cedar, beaked hazel (Corylus cornuta), downy juneberry (Amelanchier canadensis), sweet fern (Comptonia peregrina), and occasionally balsam and white and red pine in the east half of the Region, while in the west half of the Region favourite feed species are striped maple (Acer pensylvanicum), hard and soft (red) maple, white birch, yellow birch (Betula lutea) and to a lesser extent poplar, cedar and balsam.

For deer to survive the winter these feed species must occur in sufficient abundance to ensure that there is adequate food for all individuals. In addition there must be sufficient coniferous cover to provide shelter and travel lanes between feed areas.

During severe winters it is common for deer to number in excess of 12 animals/km^2 (30/mi^2) (O.M.N.R. files) in deer yards. It is not difficult to understand why starvation can often occur - particularly to fawns - when deer are confined to yarding areas for up to 5 months and available natural feed supplies are quickly depleted.

Seasonal Management Techniques and Possible Areas of Greater Cooperation

Spring and Summer

Several Districts in the Region now have annual wildlife seeding programs, wherein fertilizing and seeding of log landings and haul roads with legumes and grasses provides early green-up high protein legume forage crops in forested areas, during the spring and summer periods. This program is particularly valuable in heavily forested areas where few naturally occurring permanent openings are found.

Consideration regarding the leaving of permanent openings (with possible cultivation) when designing Woodland Improvement Agreements, particularly for properties adjacent to or near known deer yards, could be extremely beneficial to deer during the spring and summer periods.

Fall

Tentative cutting guidelines have now been established for at least one commercial cut on oak ridges with consideration for future mast production (L.M.F.N.R.C.). It would be desirable to establish Regional Standards and Guidelines for such cuts, particularly where they might affect mast crops adjacent to or near established deer yarding areas.

Winter

Owing to the difference between stand associations in the eastern and western portions of the Algonquin Region, management techniques and possible inter-disciplinary (Timber/Wildlife) problems are quite different (Figure 2).

In the east where white pine is the primary winter cover species, and also highly marketable, harvest techniques can lead to canopy reduction below 70% (Thurston pers. comm.) which is less than optimal for deer. In the west where hemlock is the major winter cover species, there is neither the same need to harvest nor the same incentive to promote regeneration, since hemlock is not as desirable a market species as white pine. To complicate matters regeneration of

almost all important winter cover species is hampered in deer yarding areas because deer will browse on all species except spruce.

Harvest techniques utilized in the poplar-pine association tend to create openings and as a result promote heavy regeneration of early succession feed species which are generally desirable as deer feed. Harvest techniques utilized in the tolerant hardwood-hemlock association, however, tend toward selection cuts and as a result do not stimulate heavy growth of early succession deer feed species.

It may be possible to create better winter deer range through closer cooperation of the two branches in such ways as the following:

- In the eastern portion of the Region where cutting methods promote plentiful food production, short term (15 years) light cuts (ensuring 70% canopy closure) in white pine stands could greatly improve cover conditions in deer yards, while increased planting of white spruce in deer yards could provide adequate long term (80 years) cover.

- In the western portion of the Region where cutting methods promote less plentiful food production, somewhat heavier cutting in tolerant hardwoods could partially rectify this situation. In addition, where necessary, a moratorium on cutting of hemlock in deer yards could greatly improve short term (15 years) cover conditions, while increased planting of white spruce in deer yards could provide adequate long term (80 years) cover.

- While logging activities will provide long term (15 years) food benefits, it is recognized that the wildlife program must be prepared to augment these activities through the Deer Range Management program by cutting browse using chain saws and axes, or, prescription burning. In addition it is recognized that if deer populations are to be maintained at high levels in this Region of severe/extreme winter conditions, it will probably never be possible to produce enough natural browse to sustain deer through all winters. Supplementary feeding must, therefore, be recognized as an acceptable short term (1 year) form of habitat management, and will be utilized to varying degrees in most deer yards depending upon the availability of natural browse and the severity of the winter. Supplementary feeding consists of providing a dietary supplement, usually in the form of mixed grain such as corn and oats, or second cut alfalfa or clover hay. The supplement is distributed throughout the deer yard at the manager's discretion usually in self-feeding containers which are re-filled at regular intervals.

Summary

Winter is the critical or primary season for deer in the Algonquin Region, since it is during the winter that deer are crowded into 5-10% of the available range (deer yards), and this crowding with its associated competition for food and shelter can lead directly to starvation. While the other 3 seasons are obviously important since they can strongly influence not only how rapidly deer can recover from the past winter's ravages, but also how well they can prepare nutritionally for the coming winter, I would say that spring, summer and fall are of secondary or indirect importance.

I feel that while generally working relationships between Forest Management and Wildlife are good across the Algonquin Region, closer cooperation could yield better results in the following areas:

1 - W.I.A. Agreements. Trees are great, but permanent openings can be very valuable to wildlife species.

2 - Oak Ridges. Regional cutting guidelines which could ensure mast production and still allow harvesting of oak (and beech) within a "reasonable" rotation are needed.

3 - Closer liaison between the two branches (perhaps in the form of a standing committee?) could hopefully result in a better understanding of each other's needs regarding the harvest of tolerant hardwoods, white pine and hemlock.

References

Verme, L.J. 1968. An Index of Winter Severity for Northern Deer. J. Wildl. Manage. 32:566-574.

FIGURE 1. Winter severity in the Algonquin Region, 1953 to 1983.

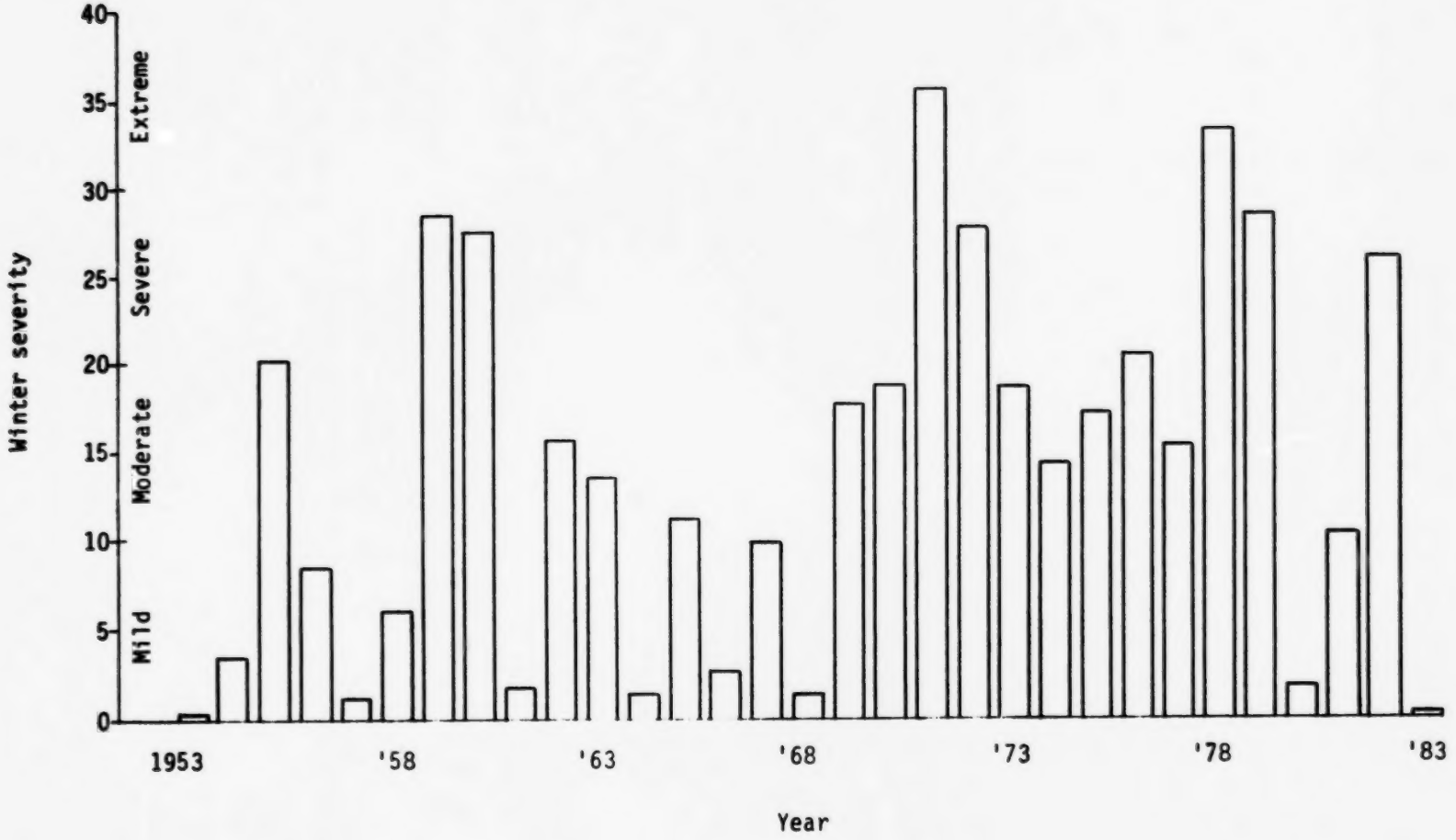
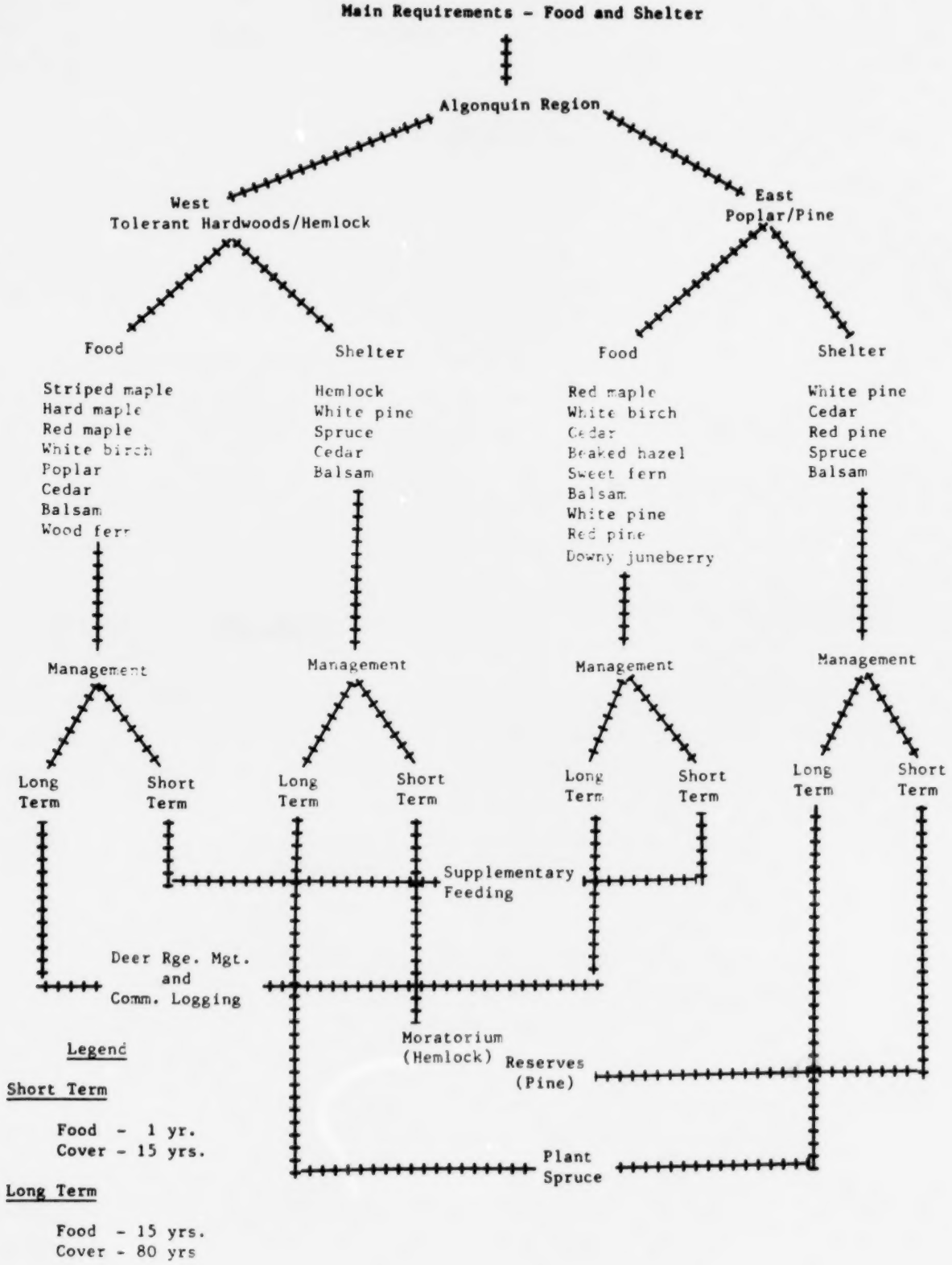


Figure 2. Winter Habitat - Algonquin Region



FOREST STAND DYNAMICS OF THE ALGONQUIN REGION

by David Wray, Regional Silviculture Specialist

ABSTRACT

The success with which a plant establishes itself and develops is primarily affected by the availability of moisture and sunlight. Moisture availability is a result of site and local climatic factors while the access to sunlight is controlled by overstory conditions. The manner in which understory vegetation develops on a variety of sites and as a result of various treatments is discussed for the main forest types found in deer yards in the Algonquin Region.

PAPER NOT AVAILABLE

FROST CENTRE DEER HABITAT MANAGEMENT PROJECTS

by Al Corlett and Mike Buss

ABSTRACT

The Frost Centre, not being well endowed with white-tailed deer wintering range, has directed its management energies toward three other important habitat management components. They are: promotion of small, less than 16 ha (40 acre) clear cuts in intolerant hardwoods to stimulate browse production and set back succession, maintenance and creation of permanent forest openings to provide herbaceous growth accessible in spring and summer, development of modified management prescriptions for red oak and beech in forest management operations to prolong and promote mast production in these species. Examples of these various techniques will be discussed.

One objective (established in 1975) for the L.M. Frost Natural Resources Centre is "to develop and implement integrated natural resource planning and management". The Integrated Plan for Land Use and Resource Development approved in 1980 satisfies the planning portion of this objective while integrated management has been an ongoing process since the inception of the Frost Centre in 1974. Consideration for white-tailed deer habitat has been made in the Frost Centre's plan and continues to be an important influence on forest harvesting operations and wildlife habitat projects.

The 24,000 hectares of the Frost Centre has historically significant deer winter areas but lacks currently large or regionally important yards. The Hindon deer yard complex lies south and west of the Frost Centre. The remainder of the winter concentration areas are small, less than 500 ha, and are associated with hemlock, pine and cedar cover which appear in fringe stands around small lakes and ponds. Larger stands of hemlock which were utilized by deer in winter prior to the early 1970's have remained relatively unused in recent years.

For the purpose of this paper we have concentrated on three important components of deer range management other than the management of winter habitat. They are: the promotion of small, less than 16 ha, clear cuts in intolerant and tolerant hardwoods, the creation and maintenance of permanent forest openings and the application of modified harvesting in red oak and beech stands.

Clear cutting small blocks of intolerant hardwood to create an abundance of summer and/or winter browse has long been an established habitat management technique for white-tailed deer. Some wildlife

habitat managers suggest that as much as 20% of forest stands should be less than 15 years old (Schmidt, J.L. and D.L. Gilbert, 1978).

The land use planning process identified several locations on the Frost Centre where clear cutting of intolerant hardwoods could be accommodated. Prevailing timber market conditions, however, made sale of these stands difficult at best. After considerable manoeuvering one such operation was undertaken in 1982 near Partridge Lake in Sherborne Township. The objective of this cut was to create improved summer forage conditions by stimulating reproduction of intolerant forest vegetation.

This 10 hectare site is sandy, well drained, with poorly drained depressions and supported a stand of poor quality 90 year old trembling and largetooth aspen, with lesser components of sugar and red maple, white pine and white birch. In the 3 years following the harvest we've noted an increase in levels of regeneration of viburnum and aspen, and a decrease in the levels of maple and birch. Some of the regeneration is now approaching 3 m in height, especially the largetooth aspen of the better sites, but potential still remains for further use by both moose and deer.

In 1984 our browse/regeneration survey showed that 84% of largetooth aspen was browsed, 59% of trembling aspen, 37% of cherry, 37% of viburnums and 36% of red maples. Utilization by moose and deer includes browsing as well as leaf stripping. Nearly all this use can be attributed to the spring and summer periods. Observations in winter show almost no use of the site.

The second area of concern has been the creation and maintenance of forest openings. A forest opening can be described as an upland area with less than 10% stocking of trees of any age. It is not a clearcut area supporting tree reproduction or lowland with aquatic grasses and sedges. Cover should consist of grasses, forbs, or shrubs. Openings from .6 ha to 2 ha appear to be most useful. Extensive work on the importance of openings to deer in Wisconsin has shown that 3 to 5 percent of deer range should be in permanent openings (McCaffery and Creed, 1969). An inventory of such openings on the Frost Centre in 1976 revealed that about 30 hectares could be classified as permanent forest openings or about 0.1% of the land area of the centre.

The improvement of the situation has brought into play the application of several techniques. Logging roads and landings are seeded with grasses and white clover and fertilized. When located within licenced areas the cooperation of the licensee is a requirement in achieving cost efficiency. Depending on the amount of work involved in preparing the site, operator subsidies have sometimes been necessary. Those sites which show the greatest potential for permanent openings are selected for landings where possible.

Selected sites other than those associated with logging operations, ranging in size from .5 to 1.0 hectares, have been clearcut, stumped, levelled, and then fertilized and seeded at a cost of approximately $3,000 per hectare. Those openings are selected on the following basis according to suggested guidelines in "How to Create

Wildlife Openings in Northern Hardwoods" by Carl Tubbs and Louis Verme, 1972:

- poorly or somewhat poorly drained, or
- excessively well drained sites
- shallow soils
- frost pockets

South facing exposures are preferred, sites within pole stage hardwoods are best (due to their limited seed production) and sites near major forest type changes improve diversity for other wildlife as well as deer.

Maintenance of openings created by other land uses, such as abandoned fields and borrow pits which require control of advanced regeneration only, have cost approximately $750 per hectare.

Considerable interest is developing in the management of red oak both because ofits ability to produce high quality logs on marginal sites for other species and because the acorns produced are high in fats and soluble carbohydrates making them an important food staple for deer and other wildlife. In a good seed year, deer have been known to consume .5 lb. of acorns per 100 lb. of body weight per day (Duvendeck, 1962).

Many factors affect acorn production, including age and tree form. Open grown trees have larger crops per unit area of crown than smaller crowned individuals in closed stands. Oaks are reported to produce the greatest mast at 20" to 22" DBH, with production declining thereafter (Fowells, 1965). One source notes 16" DBH trees producing an average of 10 lb. per year and 22" DBH trees producing 17.1 lb. per year (Michigan Dept. of Nat. Res., unpublished report).

The objective of red oak management in areas important for fall and early winter feeding by white-tailed deer is to prolong the mast producing life of the tree, improve crown size and vigour and to promote the regeneration of red oak. To this end, the following prescription is being implemented in red oak stands on the Frost Centre where oak are found adjacent to deer winter areas and make up less than 10% of the stand volume.

1. Red oak is favoured over all species of equal quality in the residual stand.

2. Vigorously growing red oak from 12" to 18" DBH with healthy crowns are given four-sided release to stimulate growth and mast production, while 1/10 acre openings have been created around larger individuals for stimulation of mast production and regeneration.

3. No oak tree smaller than 22 inches (60 cm) DBH is marked for harvest unless poor form or physical condition indicates clearly the tree will not survive until the next rotation (20 years). Low quality ("C" grade) oak trees smaller than 22 inches (60 cm) DBH on better sites should be considered for leave trees if potential for further growth is apparent.

Advanced regeneration has been supplemented by hand planting in one instance.

The treatment of beech is somewhat more subjective. Casual observation indicates that only certain beech trees are repeatedly used by black bear as evidenced by scarring on beech trunks. Presumably these trees are more consistent seeders. Our prescription in order to provide some measure of attention to beech is as follows:

> Beech trees showing repeated use by black bear will not be marked for harvesting unless all other signs indicate the tree will not survive until the next rotation (20 years). Beech will be favoured over maple of equal quality in the residual stand.

It remains undetermined what tangible effect these modified prescriptions will have on mast production or regeneration. But several mid-western states apply special techniques to oak in important deer habitats. Michigan, for example, has "Guidelines for Oak Management for Maximum Acorn Production in Relation to Deer Ranage Improvement Projects". Minnesota includes special consideration for oak in "A Minnesota Guide to Forest Game Habitat Improvement".

Experience has shown that integrated projects such as the ones described here are both technically and logistically feasible given some degree of determination on the part of forest and wildlife managers. While integrated management may initially be seen as a cost saving technique, our intuitive opinion is that there are actually additional costs if we consider planning time, the complexities of audit and the reduced forest productivity which may occur in some cases.

Facilitators of integrated forest and wildlife management based on our experience are:

- intensive preplanning on the part of the planning team
- effective communication between the planners and those who implement the prescriptions
- understanding and cooperation of industry
- freedom to manipulate stumpage rates and licensing to facilitate operation in low value hardwoods
- availability of subsidies, specifically for habitat improvement, to make marginal operations economical.

LITERATURE CITED

Anonymous. Guidelines for oak management for maximum acorn reproduction in relation to deer range improvement projects. Michigan Dept. of Nat. Res. 4 pp.

Duvendeck, Jerry P. 1962. The value of acorns in the diet of Michigan deer. J. Wildl. Mgmt. 26(4) 371-379.

Fowells, H.A. 1965. Silvics of forest trees of the United States. Agri. Handbook No. 271. U.S. Dept. of Agri. 762.

McCaffery, Keith R. and William A. Creed. 1969. Significance of forest openings to deer in Northern Wisconsin. Tech. Bull. No. 44. Wisconsin Dept. of Nat. Res. 104 pp.

Rutske, LeRoy H. 1969. A Minnesota guide to forest game habitat improvement. Tech. Bull. No. 10. Minnesota Div. of Game and Fish. 68 pp.

Schmidt, John L. and Douglas L. Gilbert. 1978. Big game of North America ecology and management. Stakpole Books. Harrisburg, Pa. 494 pp.

Tubbs, Carl H. and Louis J. Verme. 1972. How to create wildlife openings in northern hardwoods. U.S. Dept. of Agri. Pamphlet.

PANEL DISCUSSION

Panel members: **Larry Powell, chairperson**
Dave Euler
Mike Wilton
Dave Wray

The intent of the panel discussion was to provide an opportunity for further questions on the formal presentations and to expand on specific areas of concern.

Although a number of the questions were directed towards specific panel members, most prompted a response from all panel members and often from other participants in the audience.

The following questions and responses represent a summary of the discussion generated during the panel discussion:

1) What requirements do deer have for winter yards? Can deer be moved or influenced?

   Deer require adequate conifer cover that permits easy travel in extreme snow depths, and shelter from the winter winds, and a good supply of winter browse. The browse should be of good quality, provide a positive balance in food intake, and should be close at hand to avoid a negative balance in food value in getting to the feeding area and back.

   Deer can be influenced to move within a yarding area by supplementary feeding. Deer can not be influenced to the point that they will leave a traditional yarding area to move to an entirely new area.

2) How important are hemlock stands to deer survival?

   Healthy hemlock stands provide some of the best cover for deer in winter. Deer have been naturally drawn to these areas in the Great Lakes-St. Lawrence Forest. But as our hemlock stands disappear through forest succession there is a need to look at other types of conifer cover. We may have to alter our present management practices to provide some form of protection for other potential yarding areas and/or begin regenerating tree species like white spruce to establish alternate cover.

3) Why are conifer plantations not good for deer?

   Conifer plantations can provide adequate escape cover and winter cover for white-tailed deer. Unfortunately in a number of cases, they are not established in areas where there is adequate food supplies close at hand.

If plantations were kept to a reasonable size and were integrated with a support management system that produced quality browse, we are confident that they would be utilized by deer.

4) Do we know what are the specific characteristics of good deer yards?

The criteria for a deer yard varies widely across the Region. But it is generally agreed that 60% conifer cover and adequate supplies of quality browse are basic requirements.

While this is an area where more research is required, it is also an area where it is very hard to generalize because of the adaptability of the deer.

5) How do we influence private landowners to manage their land to promote better wildlife habitat?

By providing successful examples of good management on Crown land. We do believe that we can influence the management of private land.

6) How does the forest industry (Forest Management Agreements, Algonquin Forestry Authority) get input into managing for wildlife?

The forest industry has input into the process through the management plans that are now in place for each district. The concerns of the forest industry are combined with the concerns of the other users to produce a management program.

But we, as managers of public land and its resources, are responsible for management. We certainly have to listen to the forest industry's concerns but ultimately we have to make the decisions to manage.

Past history has shown us that when resources are depleted or mismanaged it is the manager that is held responsible not the industry.

7) How do we subsidize forest operations to accomplish wildlife objectives?

This question prompted a wide variation in opinions. Some felt that forest operations should be subsidized. Others felt that no compensation is required in that we are supposed to be practising forest management, not timber harvesting.

8) Can we not modify forest management to accomplish Integrated Resource Management objectives?

Yes we can, but there will be a cost to the forest industry.

Who should pay this additional cost is a question that has not been resolved.

9) **Why is there no yellow birch regeneration during low deer populations?**

Although deer appear to have a very real effect on the success of yellow birch regeneration, there are many other factors affecting establishment. With a combination of a good seed crop, mineral soil exposure, and the right amount of light yellow birch will establish itself.

To say that deer are the only limiting factor to yellow birch regeneration is very misleading.

10) Is there a problem with deer range management?

It would appear that a number of the Districts in this Region have a program to modify forest operations to improve wildlife habitat. Are we worried about an integration problem that is already in effect?

There was general agreement that we have come a long way in the last 10 years but there is still room for improvement.

11) Is there a committment from senior management to integrated resource management?

The lack of interest shown by this Region's senior management in this conference, would appear to indicate a lack of committment.

It was generally agreed by the panel and discussion group that this appeared to be true but that I.R.M. was a legitimate program and that it is alive and well in the Districts.

L. L. Powell

THE BONNECHERE DEERYARD - A CASE STUDY

by John W. Johnson, C.O. Coordinator & Wildlife Management Officer, and
Roy C. A. Gilbert, Forest Management Supervisor,

Pembroke District

ABSTRACT

The Bonnechere deeryard is somewhat unique within the Algonquin Region. The cover type is pine, the yard is approximately 90% private land and the deer population is largely protected from hunting by its proximity to Algonquin Provincial Park. Very limited habitat improvement has been carried out in the past.

Forest harvesting on Crown controlled lands is restricted by young growth and low value products; while private landowners practice the selection and shelterwood harvest system. Lack of winter browse and over population must be addressed in a long range management program.

* * * *

THE BONNECHERE DEERYARD - A CASE STUDY

Introduction

The Bonnechere Deeryard is located in the western portion of the Pembroke district in the Townships of Hagarty and Richards in the County of Renfrew. The yard is approximately 18,218 hectares (45,000 acres) in size and lies between Round Lake to the east and the southeastern boundary of Algonquin Provincial Park to the west. The core of the yard is centred around and slightly to the west of Renfrew County Road 31 (Simpson Pit Road) which runs from the Village of Round Lake Centre to Highway 60 just east of Wilno (Figure 1).

Prior to the extremely hard winters of 1970 and 1971 there were an estimated 3,000 deer in the Bonnechere yard. This number dropped to approximately 1,000 deer by 1973 and remained relatively stable until the introduction of the selective deer harvest system in 1980. Since 1980 this deer herd has steadily increased to an estimated 3,000 - 3,500 deer and shows no sign of slowing down despite generous increases in the antlerless permit allocations.

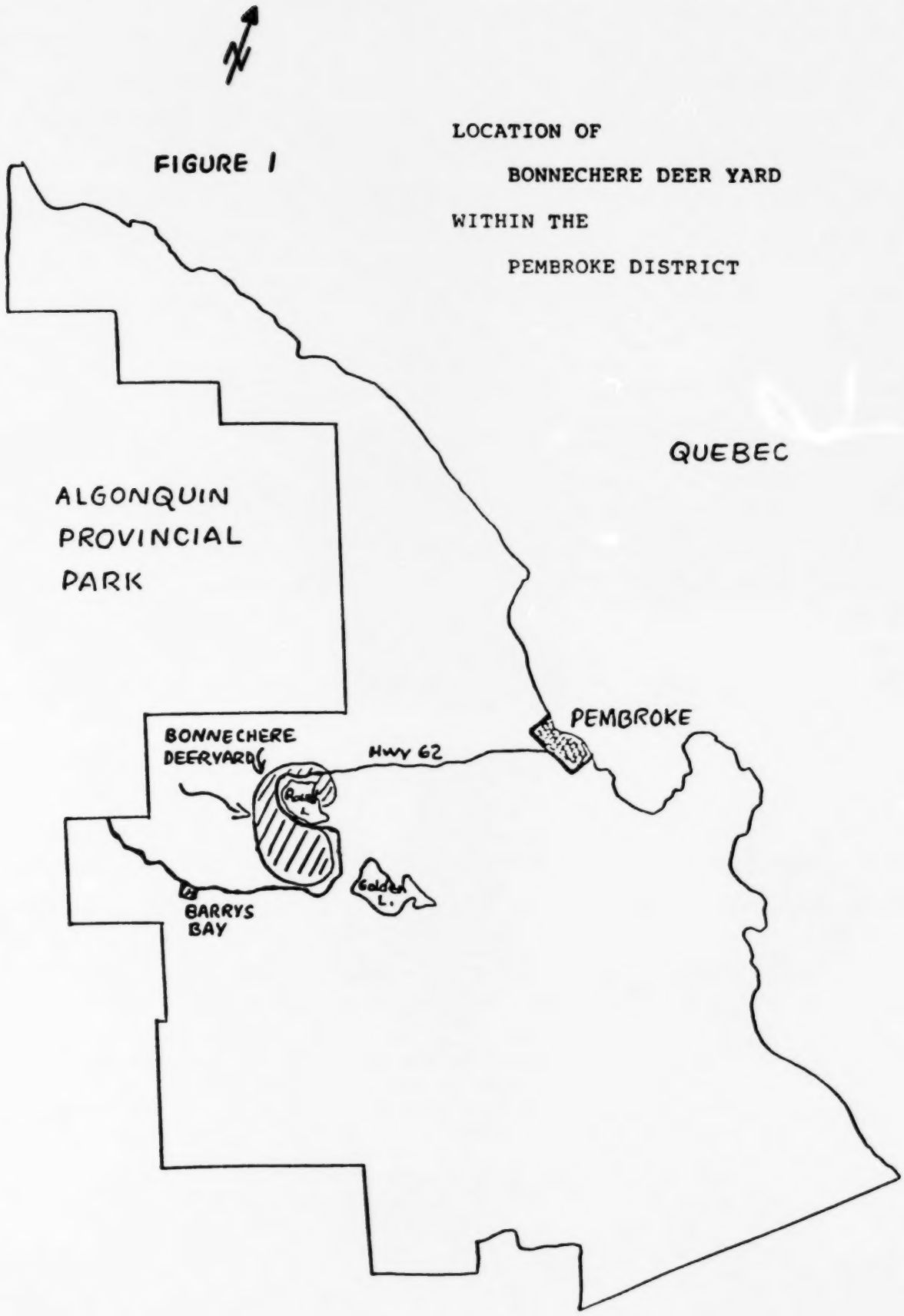
Forest Conditions

Much of the area was cleared for farming in the mid 1800's, but many of the farms have long since been abandoned. Over the years many of the abandoned fields have regenerated to poplar and jack pine or have been planted primarily with red pine. As a result this area is a patchwork of open farm fields interspersed with natural forest land and plantations. The forest cover is mainly of the mixedwood type, consisting of a number of conifer and hardwood species with a scattering of white and red pine stands.

The forest is generally of low commercial value, with the exception of the immature pine plantations and a few mature white pine - red pine stands scattered throughout the area. Much of the forest cover is of little value to deer as well because of its lack of stocking to winter cover species and overmaturity and therefore unavailability of browse. The majority of the mature pine is found in a narrow fringe along Byers Creek and the Sherwood River. It is this mature pine forest which provides the bulk of the winter deer cover. White cedar is found in insignificant amounts in this yard and is of very little importance as winter cover or browse.

FIGURE 1

LOCATION OF
BONNECHERE DEER YARD
WITHIN THE
PEMBROKE DISTRICT



Pembroke district is unique in this respect. Unlike most other yards in the region which depend on cedar and hemlock for cover, the majority of the district's deeryards are dependent on the pine species as cover. The Bonnechere deeryard has no shortage of suitable winter cover, but there is a problem in that there is insufficient browse associated with the cover and the majority of the cover is on private land.

Forest Management

Prior to 1950 the core of the yard was several miles to the northwest across the Bonnechere River where the majority of the land is owned by the Crown. Extensive cutting of the mature pine stands in the 1950s and 1960s, however, reduced the winter deer cover in this area so severely that the deer were forced to move their winter yard to its present location. Approximately 90% of the 18,218 hectares (45,000 acres) of this yard is privately owned. Most of the inhabitants of Hagarty and Richards Township depend on the forest, to some degree at least, for their livelihood. High grading in the pine and mixed conifer - hardwood stands has resulted in many of these stands being replaced by poplar and low value hardwoods.

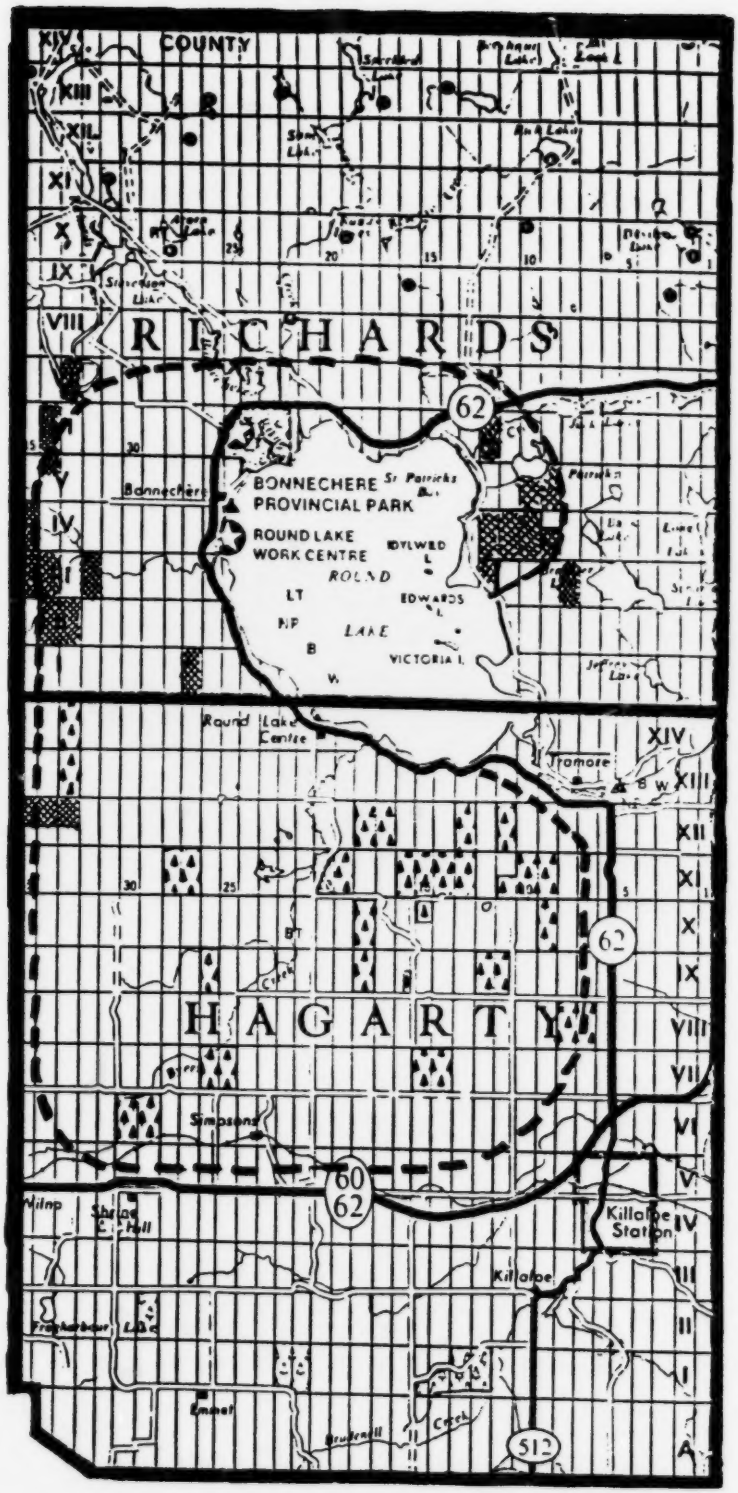
This type of forest harvesting is obviously detrimental to the landowner's best interests as well as that of the deer. Selective cutting when done improperly and for the wrong reasons not only results in the loss of future timber value and cover, but may also produce very little browse both during and subsequent to the harvest of the timber.

There are approximately 2850 hectares (7,050 acres) of Renfrew County Agreement Forest and ARDA purchase properties within the deeryard (Figure 2). Less than half or 1275 hectares (3,150 acres) of this total, however, is within the core of the deeryard.

Forest Management Branch has planted all of the abandoned fields and openings, primarily to red pine, since the acquisition of these properties. The mixed hardwood stands which are of low commercial value have, for the most part, been left untreated.

Consequently, at this point in time, a very low percentage of the land controlled by the Crown is suitable as winter deer range.

There are several properties under agreement under The Woodlands Improvement Act in this yard. There has been little conscious effort to consider



LEGEND

CROWN LAND

RENFREW COUNTY FORESTS

DEERYARD BOUNDARY

FIGURE 2 LANDS OWNED BY THE CROWN, OR MANAGED UNDER AGREEMENT BY THE CROWN WITHIN THE BONNECHERE DEERYARD

management for deer when interacting with these landowners, however.

Deer Use Patterns

The present deer herd has greatly exceeded the winter carrying capacity of this yard. Browse availability is woefully inadequate for the number of deer and supplementary feeding has been required during normal winters. Deer feeding costs have skyrocketed and there appears to be no end in sight.

Complicating the management of the deer population is the close proximity of Algonquin Provincial Park. A large percentage of the deer which yard in the Round Lake area utilize Algonquin Park as their summer range. Summer deer populations in the general area do not appear high. There is a definite migration of deer into the area from Algonquin Park starting in the fall. In early winter, at the height of the migration into the yard, aerial surveys of the area to the northwest and west of Round Lake towards Algonquin Park reveal a preponderance of major deer runways radiating from the Park boundary into Hagarty and Richards and North Algona Townships.

Because these deer are still within Algonquin Park during most annual hunting seasons they are not available for harvest. Thus, the Park deer herd should be growing at a faster rate than the remainder of the deer population in the County. There is some mortality while these deer are in the yard due to poaching, vehicle collisions and predation, but it is believed that these losses are small compared to the annual population growth.

We are now faced with maintaining an ever increasing population of deer, which contributes little to the area's recreation potential. Large quantities of feed must be provided to bring them through the winter in reasonable condition only to have them return to their summer range within the Park as soon as the snow leaves.

Forestry - Deer Interface

Deer are an ever more significant factor in the depletion of conifer regeneration in the Bonnechere deeryard. There is intensive predation of white pine, balsam fir and even red pine regeneration in areas with high concentrations of deer. This predation has been compounded by supplementary feeding of deer which holds them in these areas. Constant browsing of the leaders and annual growth

of young conifers has killed the majority of the regeneration in the maturing conifer stands. Overstory removal of pine without regeneration of pine will eventually see the end of this valuable forest type.

Wintering of deer in this yard is very closely associated with people. Many of the inhabitants of the area feed the deer in their back yards and neighbouring woodlands. This practise has led to a great deal of predation on ornamental shrubs and landscape specimens around residences and cottages. Unprotected cedar hedges and shrubs are ruined after a winter of deer feeding. Pressure to alleviate the problem or reimburse private citizens for the loss of their shrubs and regeneration is increasing.

The adverse side effect of this problem is the ever increasing pressure we receive to begin supplementary feeding activities before we believe it necessary in an effort to entice the deer away from built up areas. Some feel that this would help alleviate predation. Others suggest the earlier feeding may even increase the deer population, and therefore compound the predation problem.

Deer Habitat Management

There has been very little deer habitat management in the Bonnechere deeryard in the past ten years. This is attributed to a lack of funds and a lack of suitable properties under Crown control on which habitat management could be carried out. Another factor could be some confusion as to what best to do to solve the problem.

Over the three winters of 1982 to 1984 approximately $180,000.00 has been spent in the Bonnechere deeryard. $107,000.00 of this total was spent on supplementary feeding in the yard. A total of $33,000.00 of this money was spent on the purchase of deer feed alone.

Habitat management projects have been confined to three properties within the yard. All have been special employment projects funded under the Canada Works - Section 38 program which were sponsored by Hagarty and Richards Townships. Total funding under this program for the period 1983 - 1985 in this area was $130,000.00, including deer feeding projects.

Management Integration

There has been very little management integration

within the Bonnechere deeryard in the past.

Outside of the deeryard, forest management has carried out normal stand improvement and commercial harvest operations with little regard as to the impact of this work on the deer range.

On Crown and County Forest properties within the deeryard there has been very little intensive forest management of any kind carried out except planting, primarily because the forest types do not justify intensive management at this time. Unfortunately, few of these properties are suitable for deer at the present time either. The openings, usually abandoned fields have been planted, primarily with red pine, and the natural mixedwood forests have been largely ignored because of relatively low value.

Forest management provided only moral support to fish and wildlife in carrying out minor deer range improvement projects on three County Forest properties prior to 1985, but were not directly involved in the deer management projects.

In 1985, however, forest management and fish and wildlife cooperated in a stand improvement - deer range improvement project in Hagarty Township. This again was a Canada Works - Section 38 project. It was designed to release young white pine from overstory competition and remove poor quality trees while at the same time create small opening to promote the establishment of hardwood browse. A recent survey of the area revealed, however, that the openings created are probably too small to be of much benefit in the production of browse. Better communication between the fish and wildlife and forest management specialists as to the needs of the deer and the requirements of the browse species may have bypassed this problem.

The Future

What does the future hold for the Bonnechere deeryard, particularly if special employment and supplementary feeding funding is no longer available? Given the present numbers of deer and the amount of available browse now in the yard, starvation and die-off must be assumed to be a reasonable likelihood.

A late season hunt with a controlled number of hunters has been proposed, to begin in 1986. The hunt would take place in the area between the Bonnechere deeryard and Algonquin Park. The hunt is an attempt to harvest deer which were not available during the regular season because they were within

the Park. They would become huntable as they approach the deeryard. Such a hunt would provide another tool to manage the herd, and wherefore at least slow the increase in the deer numbers which utilize the Bonnechere deeryard.

In terms of management of the existing forests and plantations, the winter deer herd must be considered. The essential ingredient of shelterwood management of the pine type is pine regeneration. Without natural pine regeneration the type will disappear with time along with the deer cover. Cover and food must be provided, perhaps adjacent to regenerating pine stands, using the edges of the pine stand for cover in conjunction with nearby mixedwood or hardwood clear cuts for food.

Plantations will provide some cover as they grow older and deer may be accommodated with browse production in immediately adjacent mixedwood or hardwood stands.

Browse clear-cuts will have to be consciously provided adjacent to other known cover types, particularly the creek valleys and travel corridors.

The increasing deer numbers, estimated now to be up to 3,500, in a somewhat unique habitat type, altered in many different ways over time present an interesting management scenario. Will nature again control their numbers, will we be able to provide for their food and cover needs or will they simply move to a new yard? Time will tell.

CASE STUDY NO. 2: THE HINDON DEER YARD

D. G. Atkinson and P. P. Hynard

Forestry Management/Deer Habitat

Workshop

October 1985

CASE STUDY NO. 2: THE HINDON DEER YARD

by D.G. Atkinson and P.P. Hynard[1]

The Hindon Deer Yard is, without a doubt, Minden District's most important piece of wildlife habitat. Not only does it house the whitetailed deer, our most important game and viewing animal, but it is the largest of our five major wintering grounds. Last year Hindon held an estimated 2,500 animals, 25% of the district's winter population.

Figure 1: Hindon deer viewing is a popular local pastime on winter weekends.

---

[1] Fish and Wildlife Supervisor and Unit Forester, respectively, Minden District.

The Hindon Yard is the most important of the district's five yards not only because of its large area (75 sq. miles) and population (2,500 animals in 1984-85) but also because of its high snowfall accumulations and temperature extremes. Hindon deer are more sensitive to the availability of cover and browse than are our more southerly populations. Hindon has long been a focus of deer management efforts, since the bulk of it rests on Crown land over which the MNR has exclusive and total control.

The location of the Hindon Yard within the district is shown on Map No. 1.

PHYSICAL FEATURES

Hindon is a rugged and broken piece of the Canadian Shield, thinly mantled with sandy till soils and forested with an expanse of maple and hemlock. The ridgy and undulating granites and gneisses are, for the most part, covered with a variable depth (but generally shallow) Sherborne till. The soils are considerably moister than one would normally expect of shallow and sandy upland tills. The floral associations of browse and cover which have drawn deer to Hindon Township since recorded history are owed to imperfect soil drainage over much of its area, the result of glacial basal compaction and the underlying depressions in the bedrock.

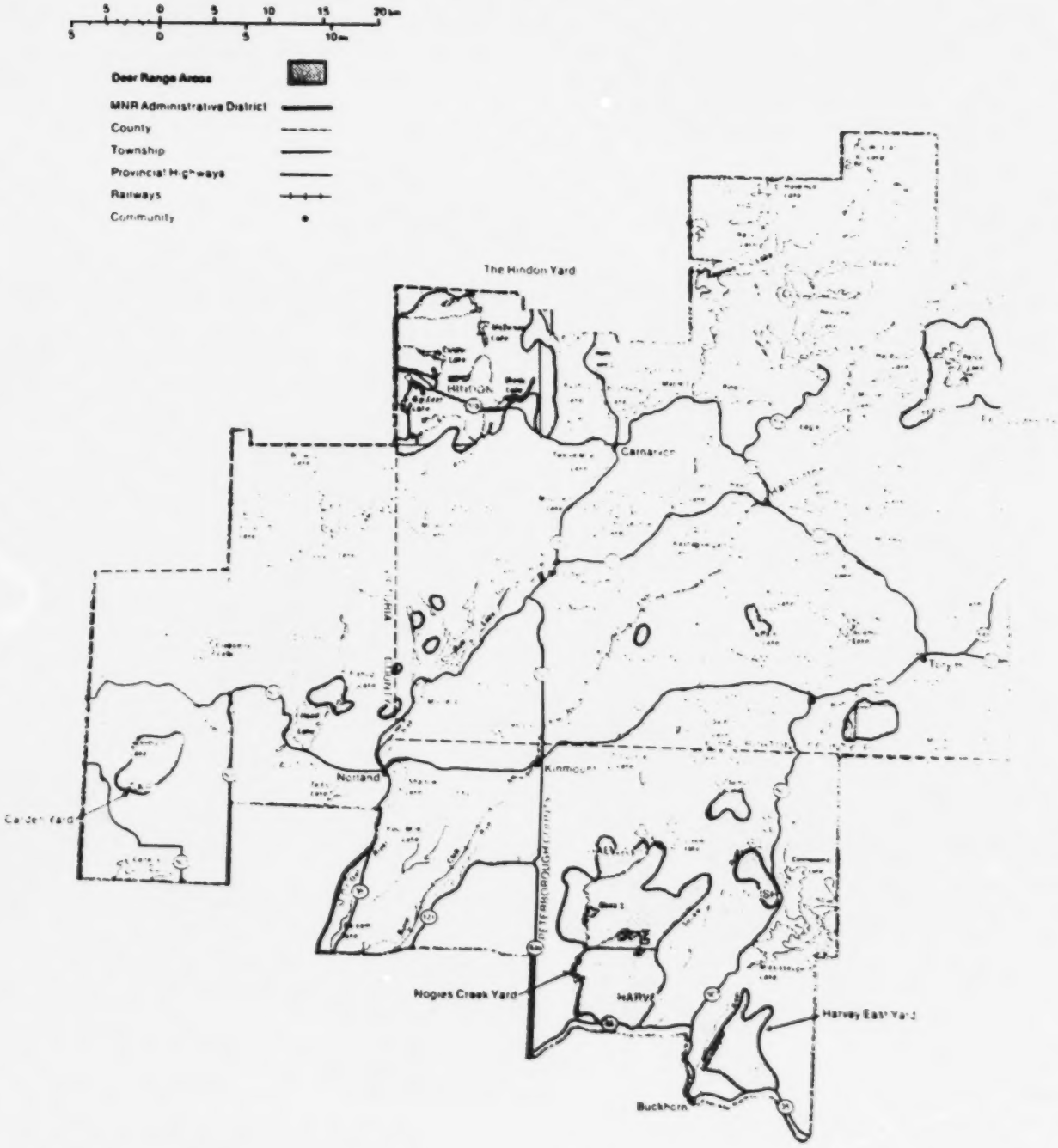
Hindon has a provincial highway, Hwy. 118, running through its approximate centre, two municipal roads on its eastern edge and a network of winter and all-weather logging roads throughout. Except for the vicinity of Brady and Kushog Lakes, Hindon is uninhabited. The pattern of Crown/private ownership may be seen on Map No. 2. Ninety-one percent of the yard is Crown land.

HINDON'S FORESTS

The Hindon Yard is a major timber producing area and one of prime importance to the MNR's forestry programme. Sugar maple is the principal tree species dominating 68% of the forest land. The area breakdown by broad forest type for Hindon Township is shown on Table 1.

MINDEN DISTRICT

MAP NO. 1: WINTER DEER RANGE



Source: *Aerial Winter Deer Surveys, 1960 to 1980*
MNR Division of Fish and Wildlife, Minden, Ontario

Map No. 2: **The Hindon Deer Yard**
The Pattern of Land Ownership

Crown Land

Private Land

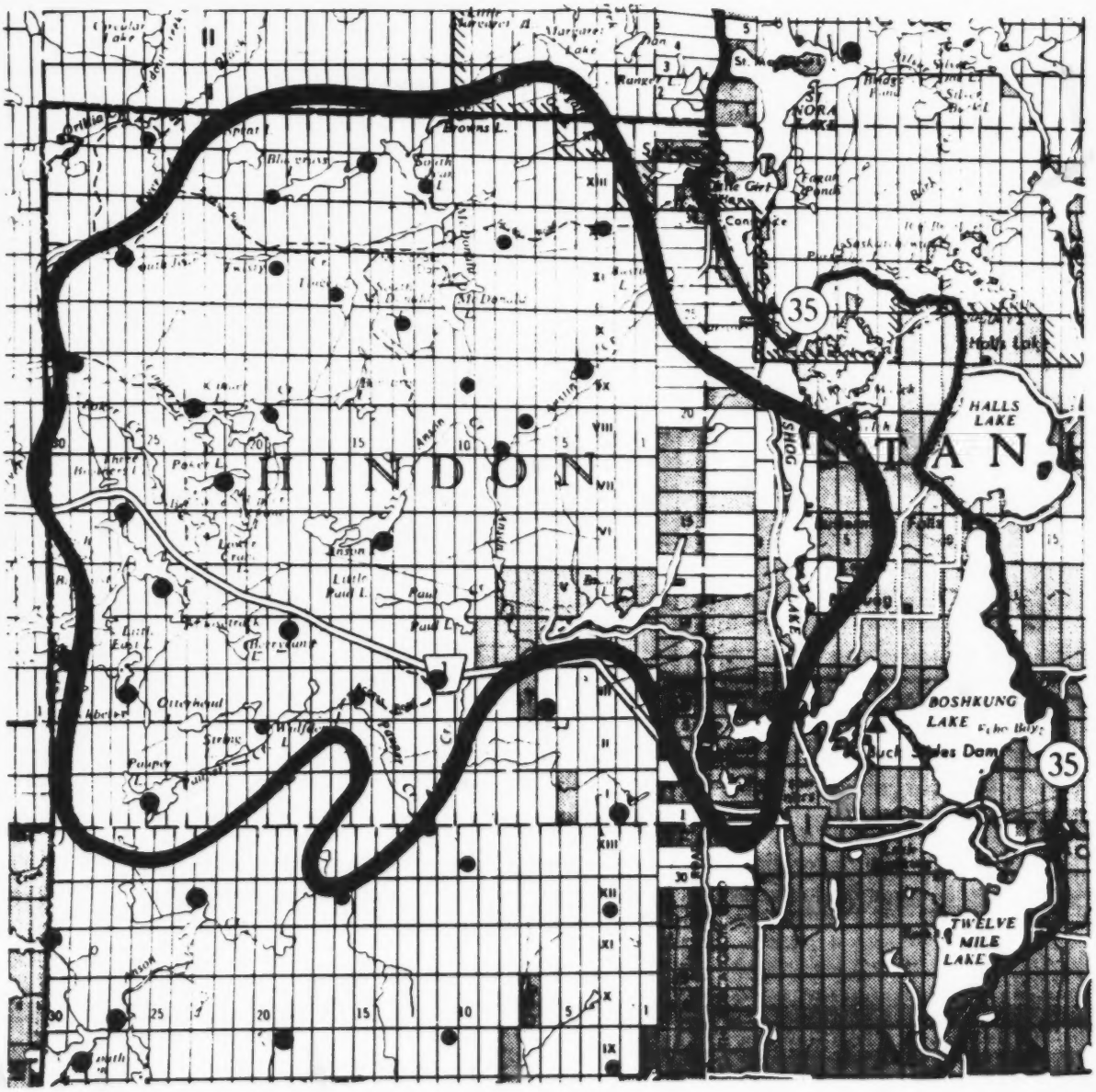


TABLE 1: Hindon Township, Crown land

Summary of Production Forest Area

WORKING GROUP	ACREAGE	PERCENT
HARD MAPLE		
- uneven-aged, cutover within 10 years	2,616	9%
- uneven-aged, > 10 years since cutting	3,266	11%
- even-aged, < 10 years of age	1,788	6%
- even-aged, second-growth polewood	9.009	31%
- even-aged, old-growth	3,276	11%
TOTAL MAPLE	19,955	68%
POPLAR		
- cutover within 5 years	578	2%
- old-growth	1,924	7%
TOTAL POPLAR	2,502	9%
WHITE BIRCH	492	2%
OTHER HARDWOODS	1,512	5%
WHITE PINE	938	3%
HEMLOCK	1,766	6%
SPRUCE	616	2%
BALSAM FIR	1,530	5%
OTHER CONIFERS	58	---
TOTALS	29,368 acres	100%

Hindon is a yard of the hardwood-hemlock type and it is this hardwood-hemlock association which most interests both wildlife managers and deer.

On the low, rounded hills where the shallow tills are relatively well-drained, sugar maple grows pure or in a weak association with white ash, basswood and other hardwoods. In the case of the well-drained soil, the forest floor is carpeted with an advance reproduction of sugar maple seedlings. On lower (or northern) slopes, in draws and on other sites where moister conditions prevail, the association drifts to progressively increasing components of beech, hemlock, yellow birch, red maple and red spruce. On these moister sites and micro-sites, the advanced reproduction of sugar maple is weakened and partially replaced by hobblebush *(Viburnum alnifolium)* and striped maple, *(Acer pensylvanicum)*.

It is worth noting that old-growth hemlock is a major component of Hindon's maple stands both as individuals and small groves, a 10%-15% of component overall.

The hemlock working group itself, of which hemlock is a 60% component, occupies the ground which is imperfectly drained. Here, the associates are red maple, sugar maple, yellow birch and red spruce. The forest floor may be virtually vacant of woody vegetation (where overhead canopies are closed) or it may support a growth of hobblebush, striped maple, balsam fir, beech and maple seedlings, red spruce and the odd hemlock.

The pattern of the hardwood-hemlock association within Hindon is portrayed on Map No. 3.

LOGGING AND FOREST MANAGEMENT

Hindon Township was first licensed for timber cutting in 1860, at about the same time as early colonization efforts were made along the Bobcaygeon Road. White pine was logged and water-driven, as elsewhere in the Algonquin Region, and the repeated burning of these former pineries created the site class 3 and 4 poplar stands that today extend along the southern limits of the yard and several areas within. The cleared land along the Bobcaygeon Road in the south-eastern corner of the Hindon Yard has been planted in red pine or allowed to reforest itself; the settlement at Hindon Hill is now only a name on old maps.

During the first half of the 1900's a number of small sawmills operated within the yard at Long Lake, Cinder Lake, Montgomery Lake and Pine Springs. These (and other) mills took the remaining old-growth pine and the best of the birch and maple, but at times hemlock and spruce were the mainstay of this logging era.

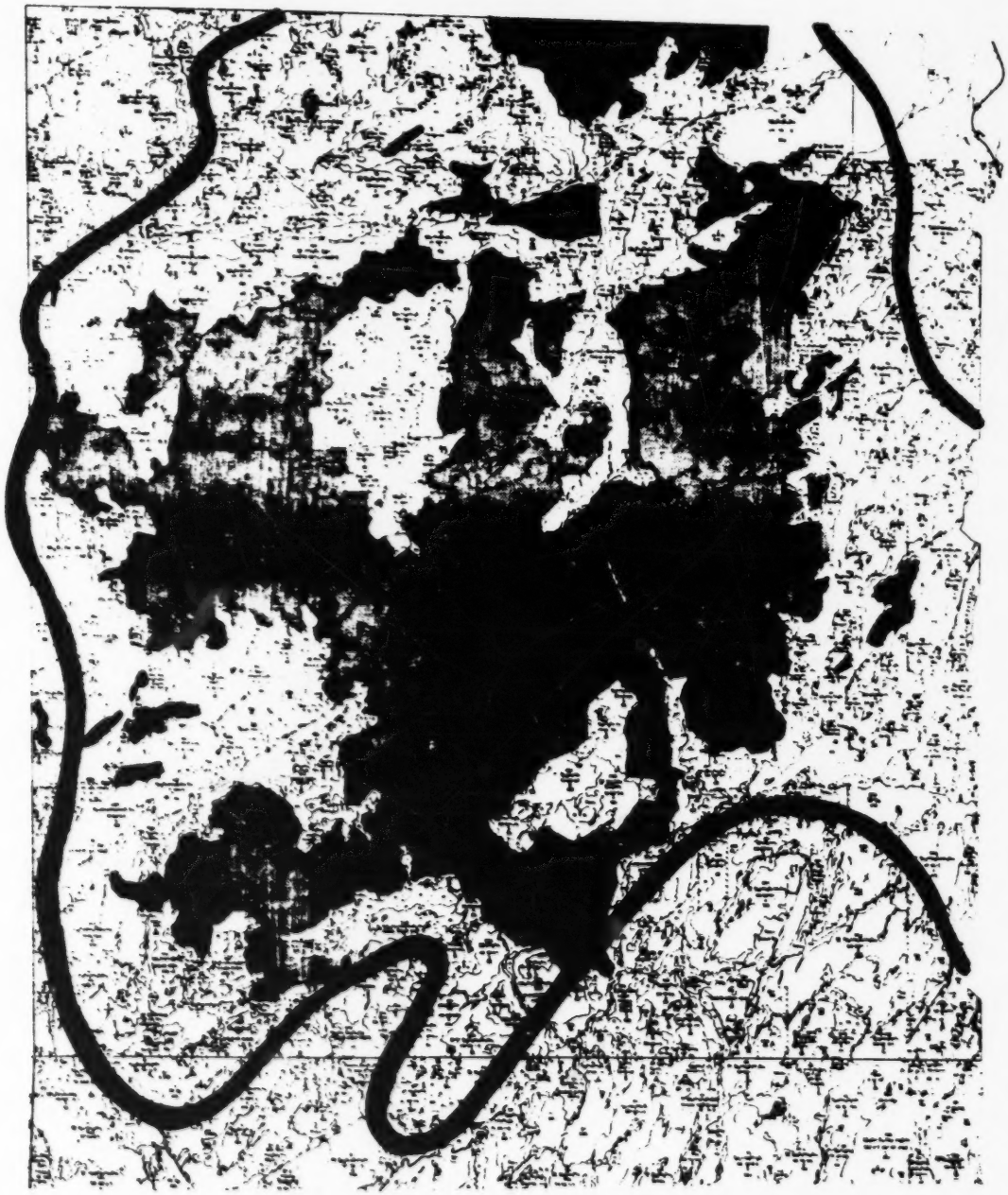
By 1945 repeated high-grading and new economic conditions had taken their toll and the down-graded forests of the Hindon Yard sat idle for the next 25 years. Only a few diameter-limit high-grade cuts were made for hardwood sawlogs on the perimeter of the yard.

The latest era of logging and forest management followed on the heels of the construction of the Hindon Access Road (1966), the Vankoughnet highway (1970) and the Poverty Access Road (1973). New access, new hardwood markets and a renewed MNR commitment to forest management made Hindon once again the place to cut. Forest management efforts began with tree girdling in the 1960's, tree marking for harvests (1972), silvicultural cutting systems (1974), a new forest

Map No. 3: The Hindon Deer Yard
The Pattern of the Hardwood-Hemlock Association

Stands Dominated by Hemlock

Maple Stands with a 10%-45% Hemlock Content



inventory (1979), management plan (1983) and operating plan (1985). More access, another 15 miles of logging roads, was built in the early 1980's. Logging is again in full swing in the Hindon Yard.

Figures 2 to 5 show the appearance of the various cutting systems employed today. The uneven-aged hard maple stands are cut selectively, with the tree marking directed at stand quality improvement. The stands dominated by old-growth and defective trees are harvested and regenerated using the clearcut system (or a variation thereof), with the emphasis on increasing the component of yellow birch and red maple on the moister sites and micro-sites. Second-growth maple stands are thinned, usually by girdling, to provide a release to selected crop trees. Poplar stands are totally clearcut and regenerated back to aspen (principally largetooth aspen). Pine stands are shelterwood cut and site prepared both mechanically and chemically; some planting of pine cutovers has occurred too.

PATTERNS OF DEER USE

Within Hindon the major browse species, according to several browse surveys, include sugar maple, hobblebush, red maple, yellow birch and striped maple; the main cover species is eastern hemlock. It is this association of both cover and browse species on the very fresh to moderately moist Sherborne tills in Hindon that has made it such a historically successful wintering ground.

When snow conditions permit, the deer prefer to roam the open hardwoods, especially those being cut or having been cutover recently, for browse. They use the hemlock groves, even individual trees, within the hardwood stands for bedding. In especially severe winters there is a tendency for the deer to withdraw to stands of hemlock where travel conditions and their ability to flee are better, even though browse conditions may be poor. In general, however, browse conditions appear to be more important to Hindon deer that do cover conditions.

The Hindon Yard has been mapped from the air almost annually for the past 25 years. While there have been historic shifts in animal concentrations within the yard over that period of time, it is clear that Hindon has finite bounds. The Hindon herd, tripled in numbers over the past five years. still remains within the bounds which have been mapped in the past.

Figure 2: An uneven-aged hard maple stand prior to harvest, stocking level 1.1.

Figure 3: An uneven-aged hard maple stand following a selection cut, stocking level 0.6.

Figure 4: A young hard maple stand 10 years following clearcutting. These stems would have been seedlings on the forest floor at the time of harvest.

Figure 5: A young largetooth aspen stand two years after clear-cutting. Where it is available to them Hindon deer browse heavily on largetooth aspen, especially during the sunny days and heavy snow crusts of March.

The shifts in deer concentrations which occur are due, at least in part, to winter severity, to the attraction of active winter logging operations and recent cutovers and to the placement of supplementary deer feeders. We suspect, too, that the local numbers may be tied to the ups and downs of the various deer groups which use the yard.

It appears that the cottage and residential developments in the vicinity of Kushog and Brady Lakes have had little impact on deer use. Nor have new access roads and snowmobile trails had an apparent effect on use patterns other than to serve as a part of the herd's own trail system. The Vankoughnet highway (Hwy. 118), which penetrates the core area of the yard, results in no more than a dozen road kills annually.

A HISTORY OF DEER MANAGEMENT IN THE YARD

Deer range management first began in Hindon during the early 1960's with the protection of hemlock from timber harvest and with winter projects of hardwood felling to produce immediate browse plus stump suckering. Rather extensive hardwood cuttings took place on patches of one or several acres throughout the yard wherever there were concentrations of deer. These operations come to an end in the late 1970's as a result of several factors: reduced D.R.M. funding, objections from Forest Management Branch and a reduced need, the result of more active logging and forestry/wildlife integration.

The supplementary feeding of deer with an 60/40 oats-corn mixture began on a small scale near Kushog Lake in the winter of 1980-81 and mushroomed throughout the yard and the district in 1982-83. The mixture is placed in wooden feeders, twice weekly on average, from December to March. In 1984-85, 30 tonnes of grain were consumed by Hindon deer.

Some trail-breaking using double-tracked snowmobiles has also been carried out in severe winters to provide access for deer from areas of cover to areas of feed. Predator control, the trapping and snaring of wolves, has been implemented on a routine basis since 1970. A total of 10-12 wolves and coyotes are taken on average each year.

Few attempts have been made to regenerate hemlock within the yard. One, a 1968 scarification project in a hemlock-hardwood stand on a moderately moist site brought in yellow birch rather than hemlock. An experimental hemlock

regeneration trial was made on a similar site in 1982, this time with better success.

THE INTEGRATION OF FOREST AND WILDLIFE MANAGEMENT IN HINDON

The district staff at Minden hold the belief that there exists a relatively high degree of integration between the forestry and deer management programmes in Hindon.

All forest access roads constructed by the MNR in the recent past have been high-standard winter roads, roads suitable for tractor-trailer rigs but without ditches, drainage or surfacing. This modification to the timber programme serves to maintain a low hunting pressure in remote areas but, more importantly, it ensures that logging within Hindon takes place during the yarding period.

The current forestry Operating Plan has placed a limit on the size of clearcuts within Hindon and deliberately dispersed these cuts throughout the yard. Clearcuts, which have averaged 150 acres over the past ten years, now average only 45 acres. Map No. 4 shows all of the cutovers of the past five years; Map No. 5 shows the dispersion of stands allocated for harvest over the next five years. The manipulation of winter habitat is now left entirely to forestry operations to effect.

The existing stands of hemlock and the hemlock component of hardwood stands on the Crown lands of Hindon have been reserved from cutting for the past 25 years. Hemlock stands, when logged, are cut specifically to improve deer habitat - usually by the total removal of the hardwood component following its natural patchy occurrence. This simple technique maintains the maximum possible cover, yet stimulates browse production on the forest floor.

Hemlock is now also protected on the private lands of Hindon under the provisions of a tree cutting by-law negotiated between the County of Haliburton and the district's forest management staff.

The Percy Lake Yard, entirely in private ownership enjoys similar protection (in addition to 4,000 acres of W.I.A. agreement with the Ministry of Natural Resources).

Map No. 4: The Hindon Deer Yard
Area Cutover, 1980 to 1985

Clearcuts
and Clearcuts with Standards

Selection Cuts

Map No. 5: The Hindon Deer Yard
Stands Allocated for Harvest, 1985 to 1990

Clearcuts

Selection Cuts

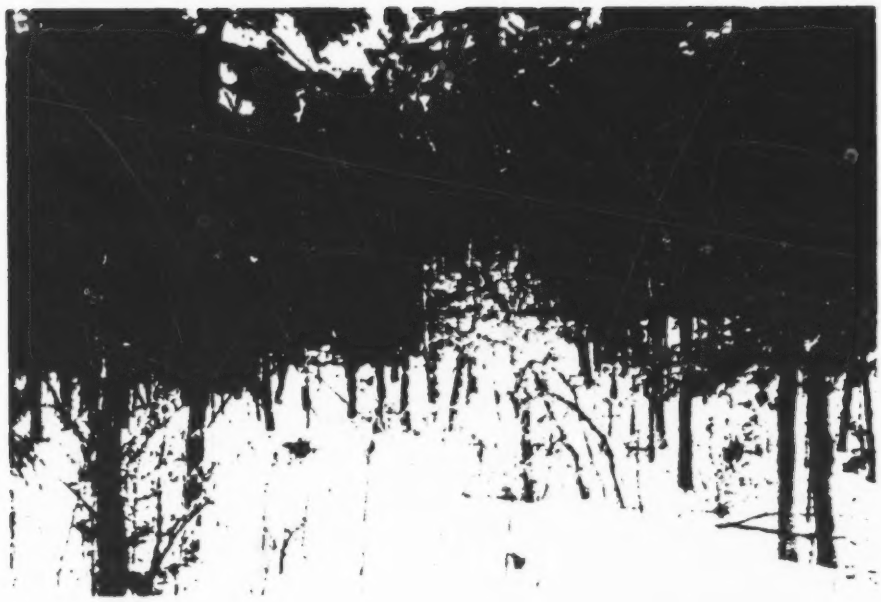


Figure 6: The new relationship of cover and browse following patchy hardwood removal from a hemlock stand.

THE IMPACT OF FORESTRY ON DEER AND DEER ON FORESTRY

There is little doubt that the new round of winter-oriented forestry activity in Hindon has had a tremendous impact on the growing local herd. It is clearly obvious to any observer of Hindon that the deer more in on new logging operations and that heavy use of the cutover continues for ten years following maple cuts and five years following poplar cuts. We feel strongly that only large-scale forestry operations can satisfactorily and economically feed a herd the size of Hindon's.

It is less clear what effect the deer will have on the species composition and stem quality of the new hardwood forest. Certainly the hardwood regeneration is browsed heavily; one browse survey showed 83% of all sugar maple and 87% of all red maple to be nipped at least once in one winter. Largetooth aspen regeneration may be hit even more frequently and browsed more severly. However, even seedlings deformed by repeated browsing soon outgrow the deer's reach, whereupon the deer shift to other more attractive corners of the yard and the trees go about their recovery by burying their defect deep within the growing stems.

The deer, or rather our integrated approach to management, has had an effect too on logging costs and profits by dispersing the cut and reserving the hemlock. Our loggers find this acceptable to them, however, as long as their operations remain profitable and the benefits to deer populations remain obvious.

A LOOK TO THE FUTURE

In the very short term we look to new refinements in our harvests, at least new for us. We want to identify and retain more good mast-producing beech in our selection cuts. Our tree markers tend to be hard on beech because of its lower grade potential but our selection cutovers tend to be of quite low stocking. We have room for more of these trees without hunting timber productivity.

We want to be more selective in the location of our feeders. To date we have placed our feeders in the cutovers where the deer are most concentrated. There are, however, portions of the yard (and the district) where smaller numbers of deer may be found in real difficulty.

Over the next ten years we see conditions in the yard continuing to improve as new logging operations open up new corners of the yard for heavier deer use. Eventually, some 10-20 years from now the level of old-growth clearcutting will drop off, but a second cycle of selection cuts within the uneven-aged and second-growth polewood stands will emerge. We hope that the carrying capacity of Hindon will stabalize at a level considerably above today's winter population.

In the long term (20 to 100 years) we must address the problem of replacing our hemlock cover, at least if we are still in the business of growing timber and deer in Hindon. Hemlock, while very long-lived, does not last forever and our current crop is mainly 150 and 200 years of age.

MOSAIC OF MINI YARDS

by Dave Deugo, Management Forestor and
Doug Hyde, Conservation Officer Coordinator and Wildlife Management Officer, Bracebridge District

ABSTRACT

During the past several years, the combined affect of favourable winters and the modified harvesting system has resulted in a significant increase in the whitetail herd size. The herd is re-occupying many areas which have been little used for over a decade. Deer are currently wintering in numerous small conifer patches throughout the District. Concurrent to this spread, there has been a slow but steady increase in demand for low value chip and fuelwood products. The combination of market for low value products and widely dispersed but small pockets of wintering deer, creates interesting management possibilities. Fish and Wildlife Branch are committed to intensive management only within four yarding complexes, three of which are mostly private ownership. Judicious management of the pockets within and outside of the yarding complexes utilizing the market for low end products could substantially improve the winter range carrying capacity. This case study will present this scenario and discuss the possibilities.

CASE STUDY BRACEBRIDGE DISTRICT

A. PART 1 FOREST CONDITIONS AND BRIEF HISTORY OF FOREST MANAGEMENT

David Deugo, Unit Forester

PART 1 INTRODUCTION

The extensive white pine forests originally found in the district were mined between 1850 and the early 1900's Settlement and the associated clearing and burning followed closely. The rapid expansion of the deer herd followed that.

Following the pine liquidation, logging of hemlock and hardwoods increased, early in this century. In the northern portions of the district excessive areas of tolerant hardwoods were clearcut for charcoal manufacture, resulting in large areas of polewood growth. The southern parts of the district saw repeated high grades for veneer and sawlog material. The cutting was virtually uncontrolled until the mid 1950's when diameter limits were introduced. Since the early 70's marking for selection and shelterwood cutting has replaced diameter limits.

i) CURRENT STRUCTURE OF THE FOREST

Note
- Limited area of conifer cover (ideal habitat requires 10-30% conifer cover)
- Land base of tolerant hardwoods and the activity therein
- Lack of activity in intolerant hardwoods during the past 20 years
- Ownership trends

ii) MARKET SITUATION

The overwhelming demand upon the district's timber resource is for high quality tolerant hardwood sawlogs and veneer logs and softwood sawlogs. This demand pattern has not changed for the past half century. The demand for low quality sawlogs of any species has been generally poor and sporadic. Demand for pulpwood of any species has never been significant. In the past few years a volatile market has developed for tolerant and intolereant hardwood chips. There has been, over the past decade, a slow but steady improvement in the demand for fuelwood. Production and sale of fuelwood and cull logs for fuelwood is becoming a regular component of most logging operations. Some small operations are currently taking fuelwood alone, feeding the southern markets.

iii) MANAGEMENT SYNOPSIS: OBJECTIVES

The optimum contribution to the district's forest based economy can best be achieved through increased availability of the large, high value, high quality sawlog products. Production of sawlog material will, therefore, be the

primary district focus. Production of high value products such as sawlogs and veneer logs will be the management objective for the pine, white spruce and hemlock working groups and the tolerant hardwoods. Lower value material such as fibre will be considered as incidental to sawlog production or as the main harvest from sites not suited to sawlog production. Tolerant hardwood species constitute the bulk of the production forest. The selection system will be preferred for managing the tolerant hardwoods, as it is biologically well suited to the production of large, high quality sawlogs. It is also the most aesthetically acceptable of the silvicultural systems. Where selection is not feasible, one of the evenaged systems will be prescribed. This will normally be uniform shelterwood. Selection management, which is our case is an integration of single tree and group selection techniques has been prescribed for three quarters of the tolerant hardwood forest. Uniform shelterwood management is the prescribed system for the white pine, white spruce, hemlock, working groups and one quarter of the tolerant hardwoods. Clearcutting is prescribed for a small portion of the white pine working group and the balsam fir, other conifer, poplar and white birch working groups.

PART 2 SLIDE PRESENTATION

- There is a strong steady demand for large high quality high value sawlog products
- We are committed to the maximum production of these products from the tolerant hardwood resource which comprises about 70% of the forested land base
- This will be accomplished by utilizing the selection and uniform shelterwood management systems. Selection will be the preferred system.
- Selection, which is a combination of the single tree and group selection techniques will produce acceptable non-winter habitat within the heavy hardwood land base.
- Such non-winter habitat can and will be enhanced by interspersion of clearcut techniques for species where clearcuts are prescribed (clearcutting is recommended for 21% of the forest base.)
- The quality of existing winter habitat in the district requires improvement, and soon.
- We have a rapidly increasing deer herd thanks to recent harvest management efforts and several easy winters.

FOREST LAND BASE — BRACEBRIDGE DISTRICT

1960-1980 WORKING GROUP	% OF TOTAL	ACTUAL CUT % OF TOTAL
WHITE PINE	1.7	0.2
RED PINE	0.4	
JACK PINE	0.3	
SPRUCE	3.4	1.1
BALSAM FIR	8.1	2.3
OTHER CONIFERS	1.2	0.3
HEMLOCK	1.9	2.1
TOTAL	17.0	6.0
TOTAL (EXCLUDING BALSAM)	8.9	3.7
HARD MAPLE	56.2	85.9
YELLOW BIRCH	1.8	4.4
OTHER HARDWOODS	11.4	2.27
TOTAL	69.4	92.6
POPLAR	10.4	1.0
WHITE BIRCH	3.2	0.3
	13.6	1.3

OWNERSHIP STATUS
% OF TOTAL FORESTED LAND

	FORESTED LAND	EXISTING YARDS	HISTORIC YARDS
CROWN	36.5	22.3	54.0
PRIVATE	63.5	77.7	46.0

The reproductive potential of that herd is tremendous.
- There is a steady and increasing demand for fuelwood products
- There is a new and potentially great demand for heavy hardwood chips
- Many small patchy coniferous stands (mainly hemlock) exist. These can be developed into small yards where a number of them exist in close proximity to each other.
- Large expanses of heavy conifer cover simply do not exist in the district. Ridge tops and lake fringes do, and in reasonable abundance.

WHAT CAN BE DONE?

PREMICE: The key to successful deer yarding seems to be control of energy expenditure and the topic has been studied thouroughly and recently and in this region.

The comments and observations I am about to present were largely taken from these reports:

1) Characteristics of hemlock stands related to deer use in east-central Ontario
   - Euler and Thurston
   - published in 1980 in the Journal of Applied Ecology
2) White-tailed Deer Habitat and Cottage Development in Central Ontario. Winter bed-site selection by white-tailed deer in Central Ontario. Both articles are authored by Armstrong Euler and Racey and Published in 1983 in the Journal of Wildlife Management.
   - One observation made by Euler and Thurston is particularly relevant:
     "Therefore, many small intersperced patches of hemlock trees could provide better winter shelter conditions for deer than large stands of conifer species"
   - Armstrong, Euler and Racey further qualified yarding requirements and identified requirements for:
     - night bedding areas
     - day bedding areas
     - travel corridors
     - feeding areas

Night Bedding Areas Possessed The Following Attributes:

- They were commonly surrounded by several coniferous trees, under a dense deep canopy near the bole of a coniferous tree and close to low branches
- 60-70% crown closure was found to be adequate
- were commonly located on north facing slopes where much of the hemlock cover was concentrated
- protection to the site from wind was offered by the surrounding topography
- these factors combined to conserve energy by minimizing wind flow, radiant heat loss and thermal spread.

Day Bedding Areas Possessed The Following Attributes:

- were located on south or west facing slopes under an open hardwood canopy
- near ridge tops
- close to travel lanes or night bedding where deep snow is not a problem
- these serve to increase insolation, thereby reducing deer energy expenditure, especially during late winter.

Travel Corridors

- areas of conifer cover between and among bedding and feeding areas
- these reduce energy requirements in travel

Feeding Areas

"This quantitative analysis concurs with previous descriptive reports. Wetzel et al in 1975 reported that most browsing took place within 40 m of shelter and Dorn in 1970 found that browsing was dependant upon and occurred near bedding sites. Huot 1974 observed that deer forage in small brushy openings adjacent to dense coniferous stands."

- In short, the low food value of available browse requires that it be located close to resting areas, again, to maintain a positive energy balance.

PART 3 SLIDE PRESENTATION: THE OAKLEY MINI YARD

- What we call the Oakley mini yard is a small block of crown land located in western Oakley Township within the Oakley yarding complex.
- The stand typing according to FRI is as follows:
  Overhead 1 - FRI typing
- These stands were inventory cruised during the summer of 1978, as part of our tolerant hardwood inventory
- The 1978 OPC identified an interesting hemlock component and pattern of occurrence
  Overhead 2 & 3 Stand Inspection Reports
- The stands were ground inspected during the winter of 1982, the hemlock patches were noted, deer were seen in the stands and fish and wildlife branch were notified
- Browse supplied were observed to be minimal during the winter of 82
- Fish and wildlife branch cut a series of small openings in the hardwood stands adjacent to cover these plots were kept small about ¼ to 1/10 ac. in size, and all wood was left in the bush
- during the winter of 1985 forest management branch, directed a local fuelwood operator to this block
- the objective was to prolong the cutting over several seasons if possible

- marking objectives in this block for the winter of 85 and beyond are and were:
- provide immediate browse from tops
- pack down trails for deer travel
- maintain intact the integrity of canopy closure of the hemlock over-story. This will maintain night bedding areas and travel corridors
- remove low quality hardwoods from among the hemlock to foster browse production
- release established under-story hemlock advanced growth before the expanding deer herd eats it
- create feeding areas of up to an acre in size. These areas will be expanded to two or three acres in size when the wintering herd is large enough to utilize the available browse
- maintain day bedding areas with south exposure or west exposure
- maintain individual hemlock and small groups of hemlocks in the hardwood blocks
- manage the majority of the hardwood component by selection
- optimize habitat diversity

-During the winter of 1985, Schell cut and removed about 100 cords from about 10 or 11 acres. He is planning to return and has purchased a DCL for the upcoming winter.

PART 4 A LOOK TO THE FUTURE

Given improving markets and dedication to habitat improvement the carrying capacity of deer range in this district can be improved. With the artificial or supplementary feeding program, the herd can be carried above or below the biological carrying capacity of the habitat. Attempts to carry our herd at a level too high for this area will result in problems of herd health and forest regeneration such as are currently being reported in Pennsylvania.

These 1981 reports by Marquis (title) and Marquis and Brenneman (title) observed that the high deer populations were having grave impact upon forest regeneration (pre-hunt population estimates were 25 per square mile at the time of cutting). It is apparent that excessive browsing can have three major effects on the establishment of tree regeneration:

A) Inadequate stocking of commercial tree species
B) Delay in establishment, which increases the time required to grow trees to merchantable size
C) Less valuable species composition

Marquis solution to the problem was as follows:

"These estimates illustrate that timber losses due to

high deer populations in northern Pennsylvania are very large. Much of this loss could be avoided by a reduction in deer population - and that reduction might be achieved with only a minor impact on Pennsylvania's deer hunting resource".

The abstract of the Marquis-Brenneman article reads:

> "Browsing of tree seedlings by white-tailed deer in the heavily forested regions of Pennsylvania has had a major effect on forest vegetation. In some areas, deer browsing has completely prevented the reestablishment of forest trees following cutting. In other areas, deer have altered species composition, reduced vegetation density and growth, limited the kinds of forest management that can be practiced, and reduced the amount of favourable habitat for other wildlife species such as grouse, rabbits, hare, turkey, and many nongame species. Attempts to protect seedlings from deer are either ineffective or prohibitively expensive. The only long-term solution to this resource management problem is to bring the deer herd into better balance with its habitat."

That point in time is still some distance away although localized situations have already occurred with some species like yellow birch. Most of you have seen or at least are familiar with the Swan Lake yellow birch deer enclosures. Future integration may involve artificial feeding in areas of desired regeneration, and manditory herd reduction for short periods to allow regeneration to establish. (Overhead)

Finally, where should we look next week:

- Crown land is one obvious candidate but,
- This slide shows the dispersion of the current or existing yards of Bracebridge District,
- Both the Woodlands Improvement Act and Advisory Services Act Agreements can be and have been written for wildlife habitat enhancement.
- It is however, unlikely that substantial sums of money will be diverted from forest management projects, to wildlife projects willingly.
- Wildlife management dollars can however be easily worked into forest management projects to accomplish wildlife management objectives.

Deer hunters themselves can contribute to habitat enhancement. Consider the Muskoka-Parry Sound Hunt Camp Owners Association with its 530 or so members. Many of these camps are private ownerships in relatively accessible locations. Much habitat improvement work is possible on these properties through the fuelwood extraction process.

CASE STUDY BRACEBRIDGE DISTRICT

B. DEER HISTORY AND PRESENT CONDITIONS

Doug Hyde, Wildlife and Enforcement Coordinator
Charlie Lauer, District Biologist
Brooke Chapple, Fish & Wildlife Technician

Deer probably began utilizing this area in the late 1800's in response to logging, wild fires & agricultural expansion.

Deer numbers are believed to have increased until the 1930's when a series of harsh winters caused their numbers to decline. The population again increased during the 1940's and probably peaked in the mid 1950's. However in the late 1950's two severe winters caused deer numbers to plummet.

Deer distribution in the Bracebridge district continued to become more restricted from 1960 through to the late 1970's. This was primarily a result of deteriorating range quality, several severe winters and high hunting pressure.

As a result of this centralization the deer habitat management plan of 1982 recognized 4 major yarding complexes in the Bracebridge District. However since 1980 the herd has expanded greatly in numbers and is again extending its range into the north half of the district. If this trend continues it is possible that the herd will utilize new or traditional yarding areas.

According to the Standards & Guidelines for deer habitat management in Ontario ideal habitat should consist of 5-20% grassy openings, 40-70% early successional forest and 10-30% conifer stands with 60-80% canopy coverage.

Surveys conducted in four major deer areas in the southern portion of the Bracebridge district in 1979-1980 indicated that early successional forest was lacking throughout this area. In addition while the grassy openings often constituted between the recommended 5-20% it was usually just over the 5%. As well many of the grassy openings were too large, associated with cottage developments or were being invaded by woody vegetation and in danger of losing their value as grassy openings.

Deer habitat management practices have consisted of the following:

a) Between 1962 and 1968 there were a number of commercial cuts designed to create browse for deer. These consisted of a series of long narrow strip cuts through stands of tolerant hardwood.

This effort apparently met with little success as deer numbers continued to decline in these areas. However this decline may have been related to a number of other factors as well.

b) Since the winter of 1967-68 hand cutting for the creation of browse in small plots (¼ acre - 3 acres) has been undertaken throughout the district. This work is generally carried out in mid-winter in low quality deciduous stands.

This program has met with variable success. Some plots quickly grow out of reach of the deer while others which are more heavily browsed provide a good source of food for 7-10 years.

In recent years plots which were cut 10-15 years earlier have been recut to once again put the food source within reach of the deer.

c) One controlled burn was conducted in the district in 1975 in Sherborne Twp. near Raven Lake. The burn covered a total of 50.2 ha and created some good summer range with early successional forests and small irregular openings.

This appears to have been a successful technique and plans have been made for additional burns. However due to the many constraints of time, weather, manpower, etc. associated with this work no other controlled burns have been undertaken.

d) In 1970, 71 & 72 in McClintock, Ridout & Stisted townships attempts were made to release & regenerate hemlock trees. Approximately 100 ha was scarified using hand tools and machinery under deciduous trees which had been girdled.

Unfortunately there has been no assessment of this work and its effectiveness is unknown.

e) From 1973-1985 a variety of browse & cover species such as dogwood, cranberry & cedar were planted throughout the district.

In areas of high deer concentrations these plants have often been very heavily browsed and subsequently died.

As a result a number of cedar plantings have been outfitted with wire cages around individual trees. This will permit the tree to grow & produce browse which will

extend through the cage. In some cases the trees are surviving well, however in other areas rabbits have come in underneath the cages & done considerable damage. This wire cage program is very expensive and labour intensive. It is probably only feasible if inexpensive labour is available, ie. JR's, CWIP, etc.

f) Since 1980 some log landings and haul roads have been seeded with a mixture of grasses & clovers to create permanent grassy openings.

This is a haul road from a winter cut from 1984 in Sherborne Twp. The area was seeded in the spring of 1985 by fish & wildlife staff.

Landings are usually about ½ to 1 acre in size and a total of approximately 25 acres has been seeded each spring. Permanent and semi-permanent openings provide the early flush of green protein rich vegetation so important to deer, especially pregnant does in early spring.

The results of this program have been excellent and these areas are not only used by deer but also by many other wildlife species such as moose, bear, grouse, rabbits, etc.

This program is very cost effective as the majority of the work, ie. clearing and scarifying of the site is completed as part of the normal logging operation. In a number of areas old fields which are being invaded with woody vegetation have been treated with machinery or hand tools to remove the invading species and return the area to a grassy opening.

WHERE DO WE GO FROM HERE?" - T.E. DODDS

First I would like to apologize for not being here at this very worthwhile seminar. I am attending another seminar that is very pertinent to my job, it deals with subject matter that cannot be gained to any extent by field experience in this Region. I am sure that my staff, the co-chairmen and other paticipants will inform me of the good ideas and technological insights that have emulated from this seminar. It was a question of maximizing my technological development.

I have been asked to comment on "Where do we go from here?". To put this in perspective in an overall sense, I would refer you to the "Southern Ontario Co-ordinated Program Strategy" where the wildlife recreation strategy states that you will strive:

- to provide opportunities sufficient to maintain the present rate of participation and quality of hunting by residents;
- to maintain the contribution to the economy of hunting by non-residents; and
- to provide increased opportunities for viewing wildlife and its habitat;

You note the emphasis on maintain. In all practibility I think you should count on some increase due to population increases.

On the other hand, the strategy for forests is to:

- produce an annual continuing supply of 5.9 million cubic metres of wood for industrial purposes by the year 2020 while maintaining the present diversity of forest products.

Southern Ontario harvests 2.7 million cubic metres of which 10% is exported. The present southern wood industry consumes 3.7 million cubic metres annually of which 1.3 million cubic metres comes from Northern Ontario and outside the province.

In simple terms this strategy states that Southern Ontario is to increase its share of the provincial contribution from 2.7 million cubic metres to 5.9 million cubic metres by the year 2020. Approximately double the present production.

Therein lies the challenge, Forest Managers, by provincial strategy, are attempting to maximize forest production and wildlife managers are trying to maintain what they already have.

This does not have to seem as drastic as it sounds. Not every acre needs to be used to maximize forest production similarly not every acre is needed to maintain wildlife. Often a combination of the two objectives without maximizing either, will accomplish a common objective.

Now, where do we go from here in this region?

You have just had an excellent seminar with excellent speakers with relevant case studies. This seminar was suggested by a group of foresters in the region, who as forest managers, have recognized a need for communication and technology exchange with wildlife managers to enable the forest managers to carry out their mandate in a co-operative integrated fashion. I complement them for this initiative. This recommendation had full support of myself and the regional staff.

Thus you have just completed this seminar and the interface has began.

You have all gained some very worthwhile ideas and knowledge from the last two days of discussion but we still have a long way to go. Forest Managers still have a great deal to learn in silviculture, stand dynamics and site selection let alone trying to co-ordinate it with wildlife management. Wildlife Managers still have a lot to learn about habitat manipulation, site selection and animal behaviour let alone trying to cope with silviculture and stand dynamics.

Continuous information exchange, dialogue and discussion will continue to narrow the gap to reach a common objective. The best place for this to occur is at the field level in the districts; Foresters to Biologists, Wildlife Technician to Forest Technician.

Now what can you do to help this process? I have a few suggestions from a forest viewpoint.

The forest program cannot use every acre to maximize production at a reasonable cost and do not have a budget allocation to do so.

To get the best bang for the buck, so to speak, Forests through a C.O.F.R.D.A. project and Guelph University have embarked on a three year program. The purpose of this program is to train foresters and technicians in soil identification to determine the better sites and what species of trees should be growing on these sites.

The objective is to direct our management effort to the appropriate species on the better sites. This may sound very basic, but we, in majority, lack these basic skills.

Wildlife managers would be well advised and encouraged to co-ordinate with the foresters at the District level and take advantage of the program. After all, soils and their location, is the basis of your habitat management.

In conjunction with soils, forest managers and wildlife managers should be participating and expanding their knowledge in the use of prescribed burn to meet their individual and common objectives. Fire personnel have expressed a co-operative and intensified effort to provide the assistance and expertise in the use of this tool that in the most part has been neglected in this region.

Wildlife managers, with foresters, should take every opportunity to visit forest operations presently being carried out and review the same areas in the ensuing years or similar operations that occurred in previous years to determine if any of these operations or specific type of operation are meeting their objectives for wildlife management.

Similarly, forest managers should take every opportunity to visit successful deer yard management areas to discuss and determine if they can modify forest harvest operations to meet the objectives of both forest and wildlife.

Forest Managers must learn all they can about the requirements of wildlife and wildlife managers should learn all they can about forest management and forest operations.

The Gravenhurst Technology Development Centre has been set up for technology transfer and I would assume that forest and habitat management may be part of their mandate. We would appreciate any suggestion that you may have to facilitate the centre developing and transferring technology to assist you, the managers, in your management efforts.

Remember, continuing dialogue is the order of the day.

I would like to express my thanks for a job well done to:
- the excellent speakers who presented papers
- workshop participants
- the Bracebridge Hockey Team for providing bar service
- the participants

And especially to Debbie Pella Keen and Wayne Wilson, who took on this task to organize this seminar.

I will be reviewing with Debbie and Wayne the seminar format and style and areas where they feel organization and communication can improve and would appreciate any input the participants may have, either in writing, or by a phone call.

Did you get what you wanted out of the seminar? If not, let us know.

Thank you very much, Debbie and Wayne, and all participants in the workshop.